

# **Revised Corrective Action Plan**

**PALCO Company Garage  
Scotia, California; LOP #12272**

Prepared for:

**Humboldt County  
Division of Environmental Health**



**Consulting Engineers & Geologists, Inc.**

812 W. Wabash  
Eureka, CA 95501-2138  
707/441-8855

July 2006  
089097.120



**CONSULTING ENGINEERS & GEOLOGISTS, INC.**

812 W. Wabash • Eureka, CA 95501-2138 • 707-441-8855 • Fax 707-441-8877 • info@shn-eureka.com

Reference: 089097.120

July 28, 2006

Mark Verhey  
Humboldt County Division of Environmental Health  
100 H Street, Suite 100  
Eureka, CA 95501

**Subject: Revised Corrective Action Plan, PALCO Company Garage, Scotia,  
California; LOP #12272**

Dear Mr. Verhey:

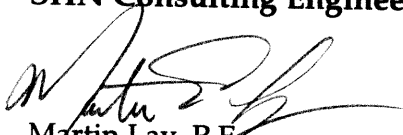
SHN Consulting Engineers & Geologists Inc. (SHN), on behalf of, and with the approval of PALCO, is submitting this revised Corrective Action Plan (CAP) to the Humboldt County Division of Environmental Health. This CAP proposes an additional bench scale treatability study and subsequent injection of hydrogen peroxide, sodium persulfate, and calcium peroxide to remediate petroleum hydrocarbons in soil and groundwater beneath the site.

Included in this plan are a brief discussion on the background history of the site, vicinity and site information, and a description of the proposed activities.

If you have any questions please call Mike Foget or me at 707-441-8855.

Sincerely,

**SHN Consulting Engineers & Geologists, Inc.**



Martin Lay, P.E.  
Project Manager

MEL/JLL/RMR:lms

Enclosure: Report

copy w/encl: Bob Vogt, PALCO

Kasey Ashley, RWQCB

Reference: 089097.120

# Revised Corrective Action Plan

## PALCO Company Garage Scotia, California; LOP #12272

Prepared for:

**Humboldt County  
Division of Environmental Health**


Prepared by:



Consulting Engineers & Geologists, Inc.  
812 West Wabash Avenue  
Eureka, CA 95501-2138  
707-441-8855

July 2006



QA/QC: 

# Table of Contents

	Page
1.0 Introduction .....	1
2.0 Site Conceptual Model.....	1
2.1 Vicinity Information .....	1
2.2 Background .....	1
2.3 Site Geology and Hydrology .....	4
2.4 Nature and Extent of Contamination.....	5
2.4.1 Contaminant Origin.....	6
2.4.2 Soil .....	6
2.4.3 Groundwater.....	7
2.5 Sensitive Receptors.....	11
2.6 Data Limitations .....	11
3.0 Corrective Action Goals .....	11
4.0 Monitored Natural Attenuation.....	12
5.0 Remedial Option.....	12
5.1 Preferred Remedial Option.....	12
5.2 Proposed Chemical Oxidant Injection .....	13
5.2.1 Chemical Oxidant Characteristics .....	14
5.2.2 Application.....	14
5.2.3 Bench Scale Treatability Study .....	15
6.0 Post Injection Monitoring.....	15
6.1 Groundwater Monitoring .....	15
6.2 Verification Soil Sampling .....	16
7.0 Approvals/Permits .....	16
7.1 Approvals .....	16
7.2 Permitting.....	16
8.0 Schedule.....	16
9.0 References Cited .....	16

## Appendices

- A. Historic Data
- B. Boring Logs

# List of Illustrations

## Tables

## Page

1. Well Construction Details ..... 4
2. Proposed Water Quality Goals..... 12

## Figures

## Follows Page

1. Site Location Map..... 1
2. Site Plan ..... 1
3. Generalized Hydrogeologic Cross Section ..... 4
4. Select Groundwater Elevations ..... On Page 5
5. Summary of Soil Analytical Results ..... 7
6. TPHD Contaminant Trends in Groundwater ..... On Page 8
7. TPHG Contaminant Trends in Groundwater ..... On Page 9
8. Benzene Contaminant Trends in Groundwater..... On Page 10
9. Summary of Groundwater Analytical Results..... 10
10. Proposed Injection Areas and Thickness ..... 15

## Abbreviations and Acronyms

APN	Assessor's Parcel Number
BGS	Below Ground Surface
BTEX	Benzene, Toluene, Ethylbenzene, and Total Xylenes
CAP	Corrective Action Plan
COC	Constituent of Concern
EPA	U.S. Environmental Protection Agency
HCDEH	Humboldt County Division of Environmental Health
ISCO	In Situ Chemical Oxidation
ITRC	Interstate Training and Regulatory Council
MCL	Maximum Contaminant Level
mg/Kg	milligrams per Kilogram
MIP	Membrane Interface Probe
MNA	Monitored Natural Attenuation
MTBE	Methyl Tertiary-Butyl Ether
MW	Monitoring Well
Na <sub>2</sub> S <sub>2</sub> O <sub>8</sub>	Sodium persulfate
NGVD29	National Geodetic Vertical Datum 1929
NGWA	National Groundwater Association
NR	No Reference
ORIN	Orin Remediation Technologies
RAFS	Remedial Action Feasibility Study
RAP	Remedial Action Plan
RAWP	Remedial Action Work Plan
ROWD	Report of Waste Discharge
RWQCB	California Regional Water Quality Control Board, North Coast Region
SHN	SHN Consulting Engineers & Geologists, Inc.
S <sub>2</sub> O <sub>8</sub> <sup>2-</sup>	persulfate anions
TPHD	Total Petroleum Hydrocarbons as Diesel
TPHG	Total Petroleum Hydrocarbons as Gasoline
TPHMO	Total Petroleum Hydrocarbons as Motor Oil
ug/L	micrograms per Liter
USGS	U.S. Geological Survey
UST	Underground Storage Tank
WP	Well Point

## 1.0 Introduction

PALCO and the Humboldt County Department of Environmental Health (HCDEH) requested SHN Consulting Engineers & Geologists, Inc. (SHN) to prepare this Revised Corrective Action Plan (CAP) for the PALCO Company Garage facility, located at the northern corner of Main and Bridge Streets in Scotia, California.

Since 1991, the (HCDEH and the California Regional Water Quality Control Board, North Coast Region (RWQCB) have provided oversight on the various phases of soil and groundwater investigations at the site. The purpose of this oversight was to ensure that the nature and extent of the releases of petroleum hydrocarbons at the site have been identified and adequately characterized.

The purpose of this CAP is to describe the corrective action that will be used to remediate the site. Hydrogen peroxide injection was selected as the preferred remedial action in the remedial action feasibility study prepared by SHN (SHN, March 2003). This remedial action was approved by the RWQCB in a letter dated April 14, 2004. Since the preparation of the remedial action feasibility study, several additional investigations have been performed at the site to delineate the vertical and horizontal extent of contamination. Additionally, sodium persulfate has recently emerged as an effective chemical oxidant to remediate petroleum hydrocarbons in fine-grained soils.

## 2.0 Site Conceptual Model

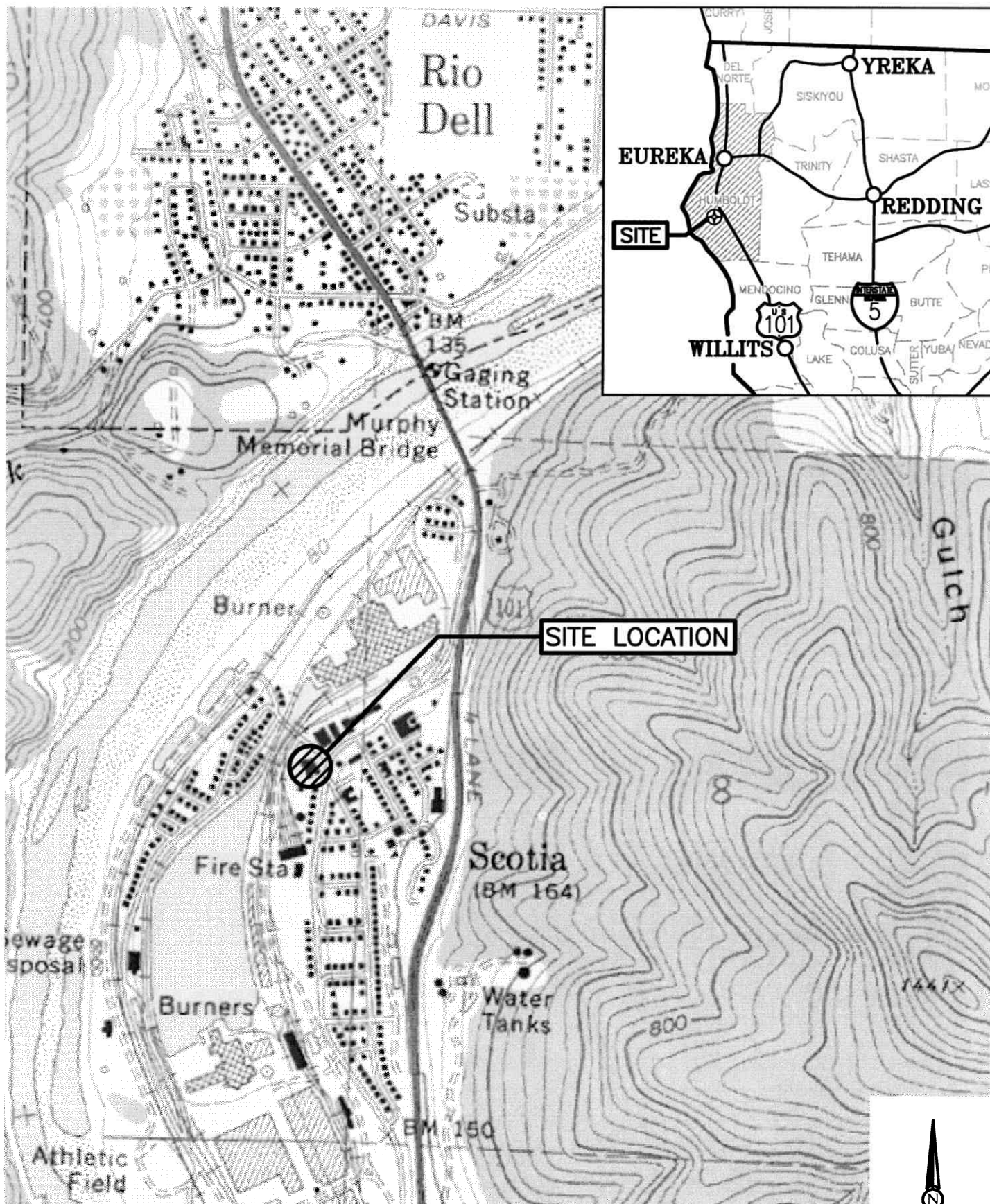
### 2.1 Vicinity Information

The PALCO Company Garage facility is located in the town of Scotia, at the northern corner of Main and Bridge Streets, Humboldt County, California (Assessor's Parcel Number [APN] 205-351-16). The Company Garage (LOP # 12272) and former Service Station (LOP #12273) are part of the same facility. The facility is located within the southeast  $\frac{1}{4}$  of the northeast  $\frac{1}{4}$  of Section 7, Township 1 north, Range 1 east, Humboldt Base and Meridian (Figure 1). The portion of PALCO's Company Garage facility that was formerly Ademar's Chevron will be considered the same site (LOP #12272).

### 2.2 Background

The existing Company Garage building was historically used for vehicle and equipment service and repair. Five Underground Storage Tanks (USTs) were formerly located at the facility (Figure 2). A 1,500-gallon diesel UST, and a 1,000-gallon leaded gasoline UST were installed in 1959; a 1,000-gallon premium unleaded gasoline UST was installed in 1972; a 12,000-gallon unleaded gasoline UST was installed in 1974; and a 1,000-gallon unleaded gasoline UST was installed at the facility in 1975.

On June 6, 1991, the 1,000-gallon leaded gasoline UST was removed, under permit, from the southeast corner of the Company Garage site. On July 27, 1998, SHN and the HCDEH observed the removal of the remaining USTs. Minimal over-excavation of soil was completed in the northernmost tank pit, which previously contained the 12,000-gallon UST. Over-excavation of contaminated soil from around the southern-most tank pits was also conducted. The tank pit locations were subsequently backfilled, and the surface was paved with asphalt concrete as directed by PALCO. Approximately 120 cubic yards of excavated soil were temporarily stockpiled



SOURCE: SCOTIA  
USGS 7.5 MINUTE  
QUADRANGLE

1"=1000'±



Consulting Engineers  
& Geologists, Inc.

PALCO Company Garage  
LOP#12272  
Scotia, California

July, 2006

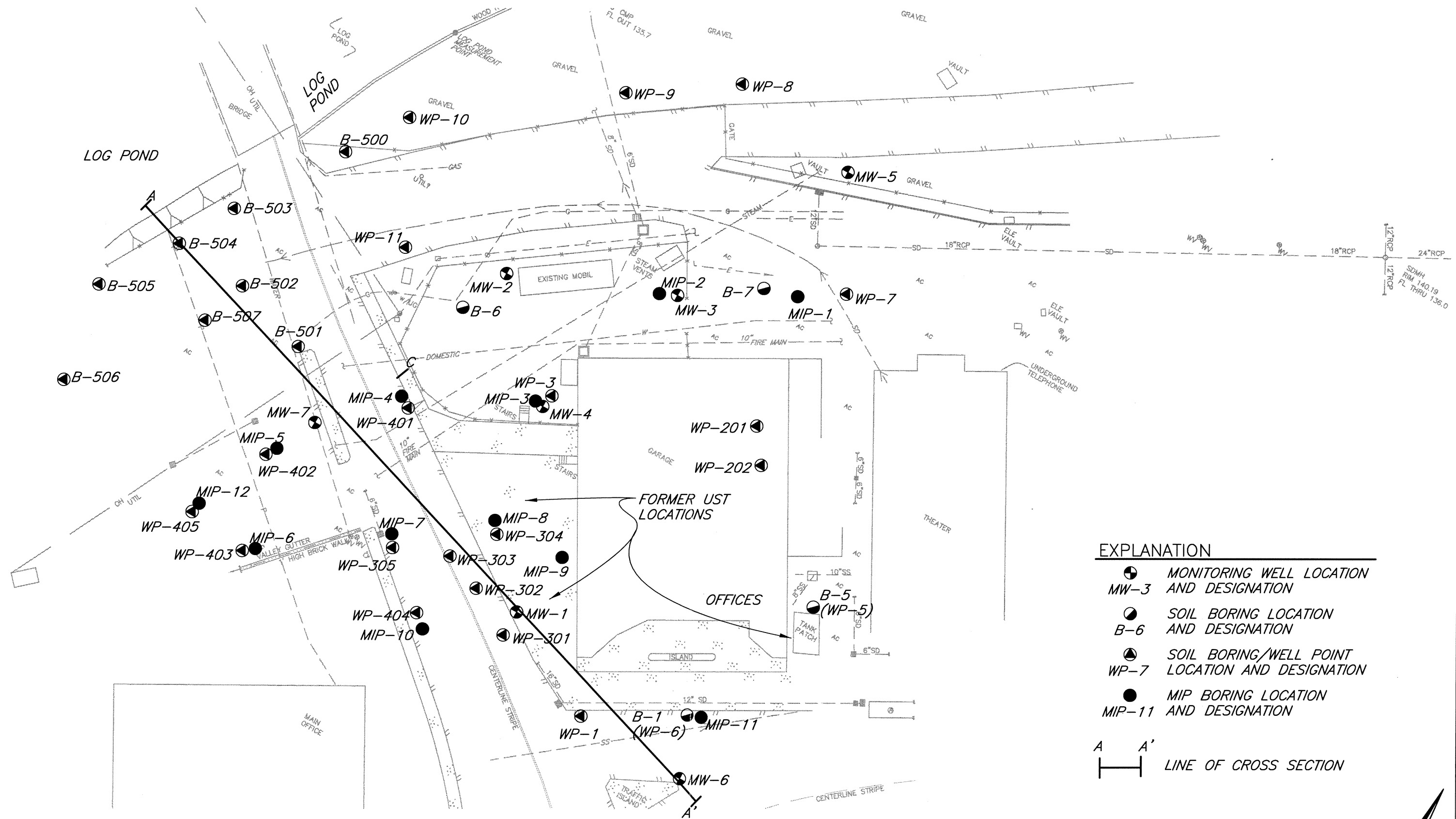
Site Location Map

SHN 089097.120

089097.120-LOCATION

Figure 1





on site, under permit, and in November 1999, were transported under manifest to Ben's Truck and Equipment Incorporated, located in Red Bluff, California, for treatment by bioremediation and subsequent disposal.

SHN conducted an initial subsurface soil and groundwater investigation at the Company Garage site in December 1999, which included the advancement of 12 exploratory borings (including 6 temporary well points using direct push methodology), and the installation of three monitoring wells (MW-1, MW-2, and MW-3). Soil and groundwater samples were collected, and analyzed, and the results of the investigation were reported in the December 1999 subsurface investigation report of findings (SHN, 2000).

The HCDEH responded, by letter dated March 23, 2000, to SHN's December 1999 report of findings. One item requested by the HCDEH was that PALCO submit a work plan to further delineate and characterize the extent of soil and groundwater contamination at the site. SHN, on behalf of PALCO, submitted the requested work plan to the HCDEH on June 12, 2000. PALCO received formal written comments relative to the work plan from the HCDEH in a letter dated August 10, 2000.

PALCO, in conformance with the modified June 12, 2000, work plan and under permit from the HCDEH, authorized SHN to complete the additional subsurface investigation and the installation of a new groundwater-monitoring well (MW-4), which occurred on November 8 and 9, 2000. Soil and groundwater samples were collected, analyzed, and the results were reported in the November 2000 Site Investigation Report of Findings (SHN, January 2001).

On May 3, 2001, representatives from PALCO, HCDEH, and SHN met to discuss the findings of the November 2000 subsurface investigation, clarify outstanding contaminant fate issues that were previously raised by HCDEH, and formulate a course of action for ongoing site investigation and monitoring. SHN submitted a meeting memorandum of understanding dated May 9, 2001, which was acknowledged by the HCDEH in a letter of May 15, 2001. The consensus that was reached at the meeting was to continue monitoring the existing wells for an additional dry and wet season, and, using the data collected, determine conditions for site closure or further investigation.

PALCO and HCDEH representatives attended an additional meeting with SHN on March 7, 2002, for the purpose of discussing the year 2001 monitoring data and requirements, and alternatives for expediting site closure. The meeting minutes were submitted by SHN in an April 3, 2002, letter to the HCDEH. On April 29, 2002, SHN submitted a letter to the HCDEH, addressing the five tasks that were outlined in our letter dated April 3, 2002.

By letter dated October 24, 2002, the RWQCB concurred with SHN's September 25, 2002, request to reduce the monitoring well sampling frequency and reporting to annual in March.

On March 6, 2003, PALCO submitted a Remedial Action Feasibility Study (RAFS) (SHN, March 2003) to the HCDEH for their review and comment. HCDEH concurred, by letter dated April 14, 2003, with the feasibility proposal of using hydrogen peroxide for the remedial action, and requested a Remedial Action Plan (RAP).

On June 9, 2003, PALCO submitted the RAP (SHN, June 2003). HCDEH conditionally concurred with the RAP by letter dated July 16, 2003, requested clarifications, and authorized the proposed pilot study.

RAP clarification items were submitted by PALCO to HCDEH on September 5, 2003. HCDEH commented on clarification items by letter dated October 9, 2003.

PALCO responded to HCDEH comments by letter dated November 13, 2003. On December 24, 2003, PALCO submitted to HCDEH the project Remedial Action Work Plan (RAWP) (SHN, December 2003).

On January 8, 2004, PALCO submitted the application and documents for the project Report of Waste Discharge (ROWD) to the RWQCB (SHN, January 2004).

HCDEH commented on the RAWP by letter dated February 17, 2004. On February 24, 2004, the RWQCB commented by letter to the ROWD. PALCO responded to the RWQCB with Addendum No. 1, dated April 14, 2004, to the ROWD.

On January 29, 2004 SHN installed two soil borings (WP-201 and WP-202) under the company garage facility. Borings were advanced using a three-inch diameter hand auger. Soil samples were collected from immediately above the saturated zone. Results were presented in the report of findings and first quarter 2004 groundwater monitoring report (SHN, May 2004).

On March 17, 2004 SHN supervised Fisch Environmental of Valley Springs, California in the advancement of six soil borings and two subsequent groundwater-monitoring wells (MW-5, MW-6, WP-301, WP-302, WP-303, WP-304, and WP-305). Soil samples were collected immediately above the saturated zone. Additional samples were collected from the saturated zone at WP-301, WP-302, WP-303 and MW-6. Results were presented in the report of findings and first quarter 2004 groundwater monitoring report (SHN, May 2004).

On May 14, 2004 the RWQCB issued General Waste Discharge Requirements Order No. R1-2004-0020 approving the remedial action and Monitoring and Reporting Program R1-2004-0044 for the site.

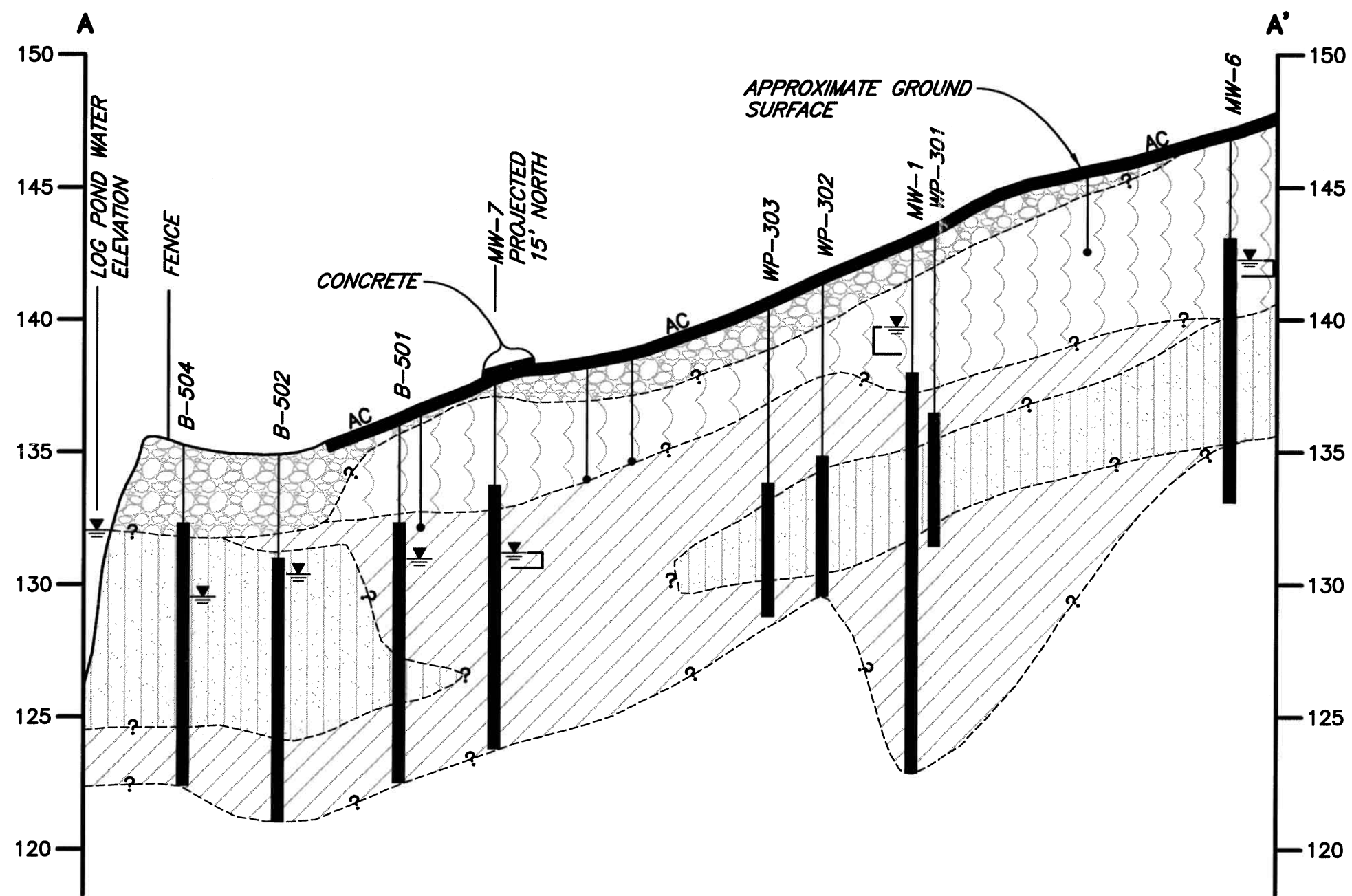
In a letter dated July 16, 2004, the HCDEH requested additional borings to completely delineate groundwater contamination. On September 23 and 24, 2004, SHN supervised Fisch Environmental of Valley Springs, California in the installation of 12 Membrane Interface Probe (MIP) borings and five soil borings/temporary well points. Results were presented in the report of findings for additional site investigation (SHN, December 2004).

On March 4, 2005, SHN supervised Fisch Environmental in the advancement of one soil boring and subsequent groundwater monitoring well installation (MW-7) at the Company Garage site (SHN, May 2005).

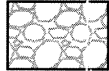

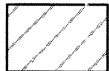
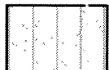




On May 14, 2005, coverage of remedial actions at the site under Waste Discharge Requirements Order No. R1-2004-0020 was terminated.

On February 27, 2006, SHN submitted, to HCDEH on behalf of PALCO, a schedule of 2006 proposed work tasks for this site. The February 27 letter was written in response to the HCDEH letter of January 31, 2006.

In a letter dated January 27, 2006, the RWQCB rescinded Monitoring and Reporting Program No. R1-2004-0044.



# EXPLANATION

-  FILL, GRAVELY
-  FILL, CLAYEY
-  SILTY CLAY OR CLAYEY SILT
-  SILTY SAND OR CLAYEY SAND
-  WATER ELEVATION MARCH 10, 2006  
(FEET NGVD 29)
-  SCREENED INTERVAL
-  RANGE OF GROUNDWATER  
ELEVATIONS (NGVD 29)
-  UNDERGROUND UTILITY
- AC ASPHALTIC CONCRETE SURFACE

SCALE: 1"=40' HORIZ  
1"=5' VERT

In a letter dated March 9, 2006, the HCDEH concurred with the schedule of 2006 proposed work tasks and work plan addendum, which outlined a new performance schedule and included a work plan to determine if the log pond was being impacted by contaminants originating from the Company Garage site.

On March 9, 2006, SHN supervised Fisch drilling in the installation of wellpoints B-500 through B-507. Results are included in the Subsurface Investigation Report of Findings (SHN, April 2006).

## 2.3 Site Geology and Hydrology

Located on the south limb of the Eel River syncline, the Company Garage site is located on a fluvial terrace, approximately 1,000 feet southeast of the Eel River. Sedimentary deposits underlying the site consist of late Quaternary age alluvium deposited by the Eel River. According to the subsurface exploration logs for the piezometers and borings installed at this site, these deposits consist of medium-stiff to stiff clayey silt, with few gravels, which was moist to very moist and gray to yellowish brown in color, and contained few wood fragments or organic debris. Figure 3 is a cross section that shows a conceptual model of the subsurface lithology at the site, along the designated line shown on Figure 2.

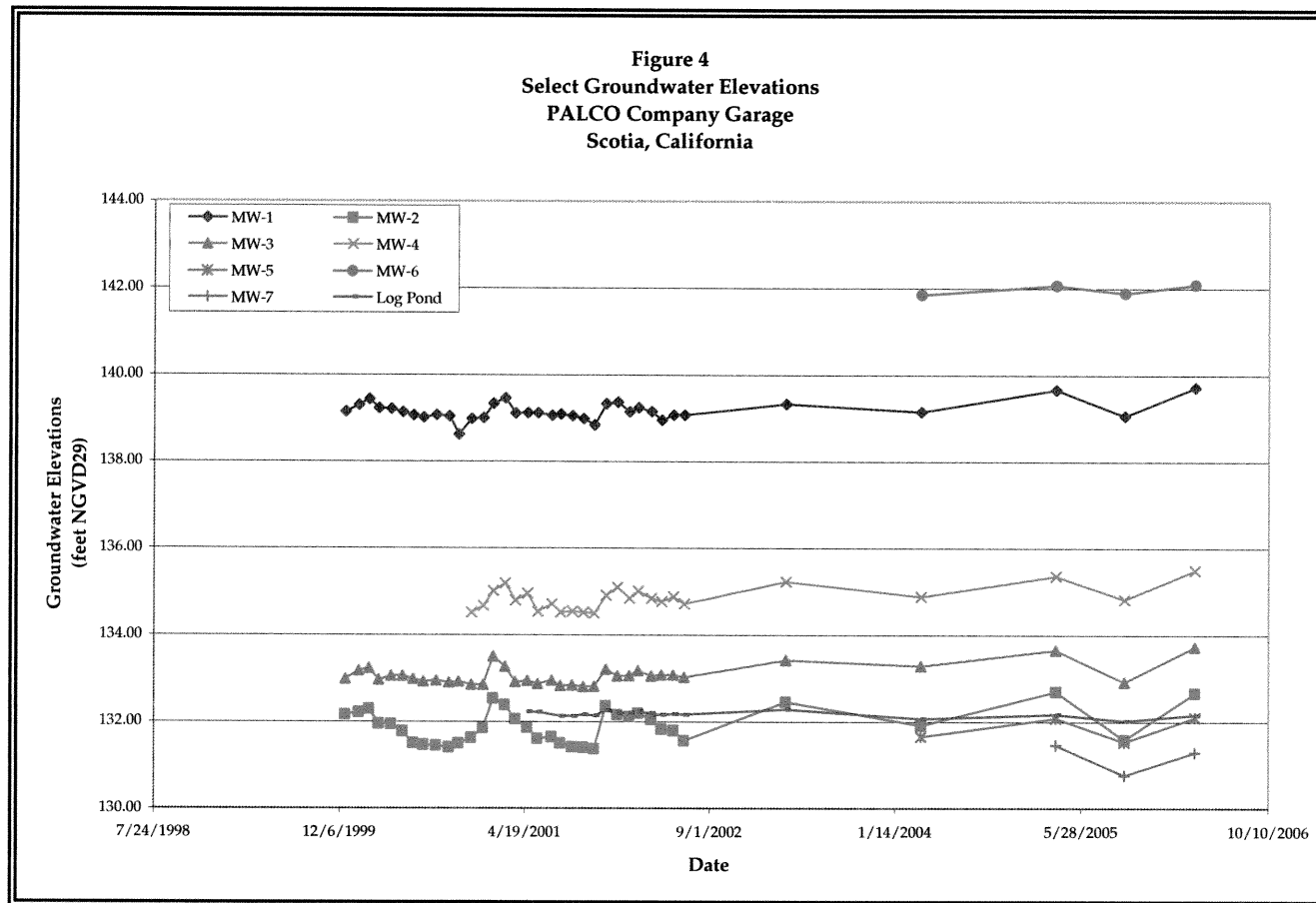
Depth to groundwater ranges between 3 and 6 feet below grade. Additionally, a log pond, with a varying water surface elevation of approximately 132 feet (North America Vertical Datum 1929), is located approximately 100 feet northwest of the site.

<p align="center"><b>Table 1</b>  <b>Well Construction Details</b>  <b>PALCO Company Garage, Scotia, California</b></p>			
<b>Well ID</b>	<b>Well Diameter (inches)</b>	<b>Total Depth of Well (feet BGS)<sup>1</sup></b>	<b>Screened Interval (feet BGS)</b>
MW-1	2	20	5-20
MW-2	2	15	5-15
MW-3	2	15	5-15
MW-4	2	15	5-15
MW-5	2	15	5-15
MW-6	2	14	4-14
MW-7	2	15	5-15
1. BGS: Below Ground Surface			

Groundwater flow direction has been, throughout the period of monitoring (1990 to present), consistently toward the northwest (toward the log pond). Groundwater gradient for the past four monitoring events has averaged 0.046.

A slug test was performed in well point WP-304 and monitoring well MW-1 in March 2004. Three rising head slug tests were completed at each location to determine the localized hydraulic conductivity in the area of the company garage.

Slug test data from WP-304 and MW-1 were analyzed using spreadsheets compiled by the USGS for the analysis of slug test data (Halford & Kuniansky, 2002). Using the spreadsheets, a hydraulic conductivity of 0.01 feet per day was calculated for WP-304, and 0.007 feet per day for MW-1. ( $3.0 \times 10^{-6}$  and  $2.5 \times 10^{-6}$  centimeters per second, respectively).



Using an approximate hydraulic gradient of 0.05, an estimated effective porosity of 10%, and an average hydraulic conductivity of 0.0085 feet per day, the resulting groundwater seepage velocity is 1.5 feet per year. (SHN, May 2004)

## 2.4 Nature and Extent of Contamination

Contaminants of Concern (COCs) for the site include; Total Petroleum Hydrocarbons as Gasoline (TPHG) and as Diesel (TPHD); and Benzene, Toluene, Ethylbenzene, and total Xylenes (BTEX). Methyl Tertiary-Butyl Ether (MTBE) concentrations detected in groundwater from the site wells are less than the California Department of Health Services primary Maximum Contaminant Level (MCL) of 13 micrograms per Liter (ug/L) (Marshack, 2003), and therefore is not considered a contaminant of concern.

### 2.4.1 Contaminant Origin

It is assumed that the contaminants of concern originated from leaks in the underground storage tanks that were removed from the site in 1998. Visual observation and soil analytical results confirmed the presence of COCs in the excavation pits. Subsequent groundwater monitoring events and subsurface investigations confirm that the source of the COCs at the site is most likely the former USTs.

### 2.4.2 Soil

Twelve soil samples were submitted for petroleum hydrocarbon analysis during the 1999 monitoring well installation and subsurface investigation. The results indicate the bulk of the gasoline and diesel contamination is located in the vicinity of soil borings B-2 and B-3. Borings B-2 and B-3 were located under the existing garage building and were collected at depths of 24-30 inches and 9-12 inches Below Ground Surface (BGS), respectively. Elevated levels of gasoline and diesel were also detected in soil borings MW-1 and WP-2, located at depths of 5.5-6 feet and 4-4.5 feet BGS, respectively. Concentrations of benzene, ethylbenzene and m,p xylene were detected in less than half of the soil samples. Concentrations of toluene and o-xylene were not detected in any of the soil samples collected. MTBE was detected in soil boring MW-1 at a depth of 5.5-6 feet. Contamination was not detected in soils collected from soil borings MW-2 or WP-5.

Sixteen soil samples were submitted for petroleum hydrocarbon laboratory analysis during the 2000 subsurface investigation and monitoring well installation. TPHG was present in soil samples collected from boring MW-4, located downgradient of the former 12,000-gallon gasoline UST, and in boring WP-7, located downgradient of the former 1,000-gallon unleaded gasoline UST. TPHG was not detected in soil samples collected from borings B-6, B-7, WP-8, WP-9, WP-10, and WP-11. TPHD was detected in the shallow soil samples (2.5 feet to 4 feet BGS) collected from soil borings B-6, B-7, WP-8, and WP-9 at concentrations ranging from 1.4 milligrams per Kilogram (mg/Kg) in B-7, to 47 mg/Kg in soil boring B-6. TPHD was also detected in the soil samples collected from 5 feet to 7 feet BGS from borings B-7, WP-7, WP-8, and MW-4, at concentrations ranging from 1.0 mg/Kg in B-7 to 5.1 mg/Kg in MW-4. TPHD was not detected in soil samples collected from borings WP-10 and WP-11. Concentrations of benzene, toluene, ethylbenzene, and total xylenes were only detected in the soil samples collected from boring MW-4. Concentrations of MTBE were not detected in any of the soil samples collected.

Two soil samples were submitted for laboratory analysis during the January 2004 subsurface investigation. The soil samples were collected from 2 to 2.5 feet BGS beneath the Company Garage. No petroleum hydrocarbon constituents were detected in the soil samples. Ten soil samples were submitted for laboratory analysis during the March 2004 subsurface investigation and monitoring well installation. Low to moderate concentrations of petroleum hydrocarbons, including TPHD, TPHG, and BTEX, were detected in soil from borings WP-301, WP-302, WP-303, and WP-305. No petroleum hydrocarbon constituents were detected in soil from borings MW-5 and MW-6.

Five soil samples were submitted for analysis during the September 2004 subsurface investigation. The samples were collected from soil borings WP-401 through WP-405, located to the west and cross-gradient from the former USTs. Very low-level petroleum hydrocarbon constituents were detected in all five soil samples analyzed.

Twelve MIP borings, performed as part of the September 2004 subsurface investigation, were placed to determine the extent and thickness of contamination in soil. The MIP borings showed that significant concentrations of petroleum hydrocarbons were present in the vicinity of MIP-8 and MIP-9. No significant response was detected at MIP-12 and MIP-5. The MIP borings showed that the majority of the hydrocarbon contaminated soil is located in the vicinity of MIP-8 and MIP-9.

One soil sample was submitted for analysis during the March 2005 subsurface investigation and subsequent groundwater monitoring well installation. No petroleum hydrocarbons were detected from the boring MW-7.

Eight soil samples were submitted for analysis during the March 2006 subsurface investigation. No petroleum hydrocarbons were detected in the eight soil samples analyzed.

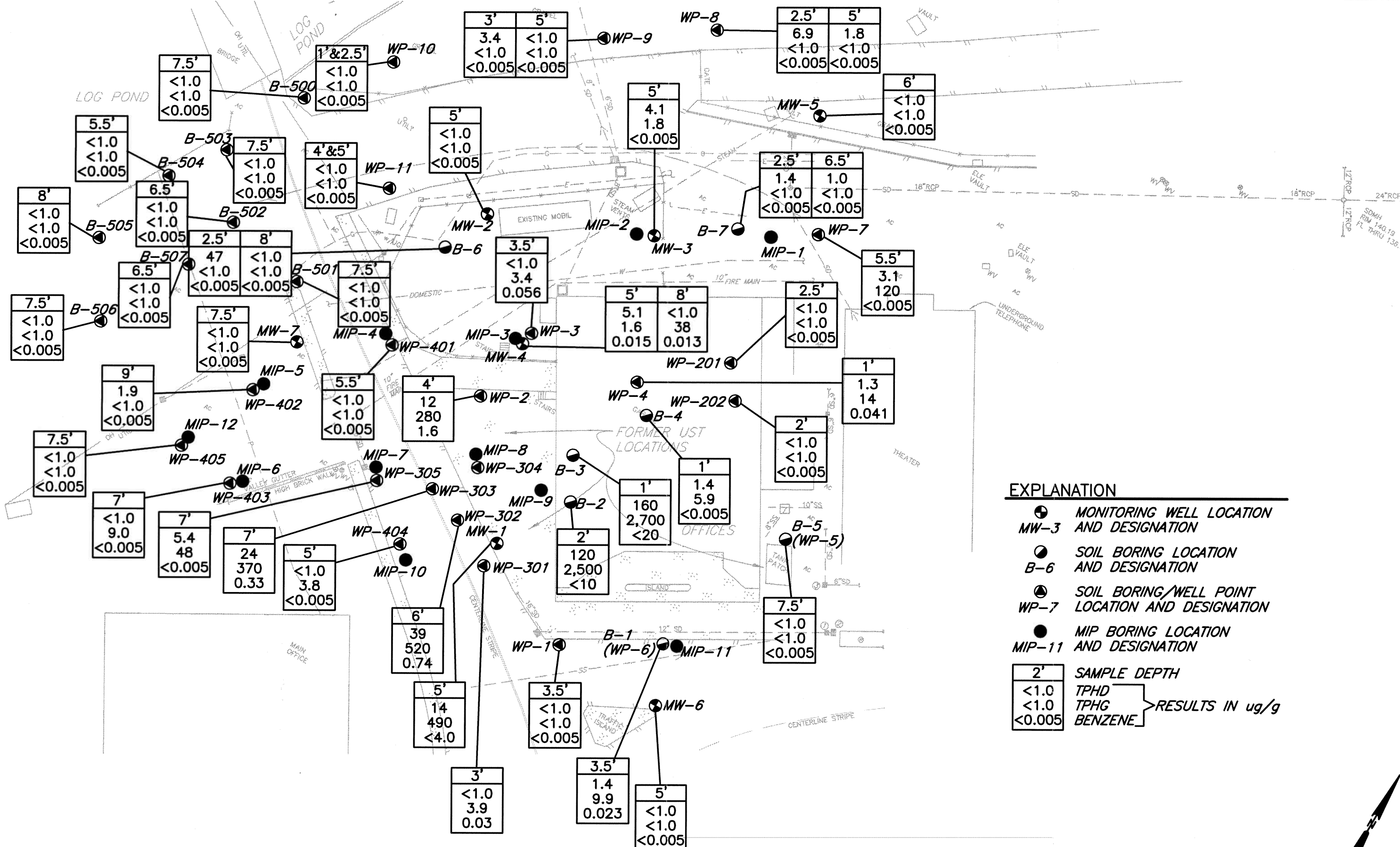
Based on the results of extensive subsurface soil investigations at the site, it appears that the majority of the petroleum-contaminated soil is located in the vicinity of the western former USTs. Lower level petroleum hydrocarbon contaminated soil is located further west of this area and to the north. The vertical extent of soil contamination appears to extend from approximately 4 feet BGS to a maximum depth of 15 feet BGS based on MIP boring log data (SHN, December 2004). Figure 5 shows a summary of soil analytical results to date, and soil analytical results are summarized in Appendix B, Table B-7.

### **2.4.3 Groundwater**

COC in groundwater at the company garage consist of TPHG, TPHD, and benzene. Quarterly groundwater sampling of monitoring wells MW-1, -2, and -3 has occurred since December 23, 1999, monitoring well MW-4 since November 14, 2000, MW-5 and MW-6 since March 25, 2004, and MW-7 since March 24, 2005. The highest concentrations of the COC have historically been detected in groundwater samples from monitoring well MW-4. Moderate concentrations of the COC have historically been detected in groundwater samples from monitoring wells MW-1, MW-3, and MW-7. COC have rarely or never been detected in monitoring wells MW-2, MW-5, and MW-6. COC concentrations have remained relatively constant over the groundwater-monitoring period.

Groundwater sampling has also historically occurred through temporary well points strategically located across the site to characterize and delineate the extent of groundwater contamination. TPHD has been detected at concentrations in excess of 100,000 ug/L at well point WP-3; at concentrations less than 100,000 but greater than 10,000 ug/L at well points WP-2, WP-201, WP-301, and WP-302; at concentrations less than 10,000 ug/L but greater than 1,000 ug/L at well points WP-4, WP-202, WP-303, WP-305, and WP-403; at concentrations less than 1,000 ug/L but greater than the detection limit at B-1, B-503, B-507, WP-7, WP-8, WP-10, WP-401, and WP-404; and has not been detected in groundwater samples at temporary well points B-5, B-500, B-501, B-502, B-504, B-505, and B-506. Figure 6 shows the historical trend of TPHD concentrations in groundwater at select monitoring wells. The trend indicates that TPHD concentrations are gradually increasing in groundwater.

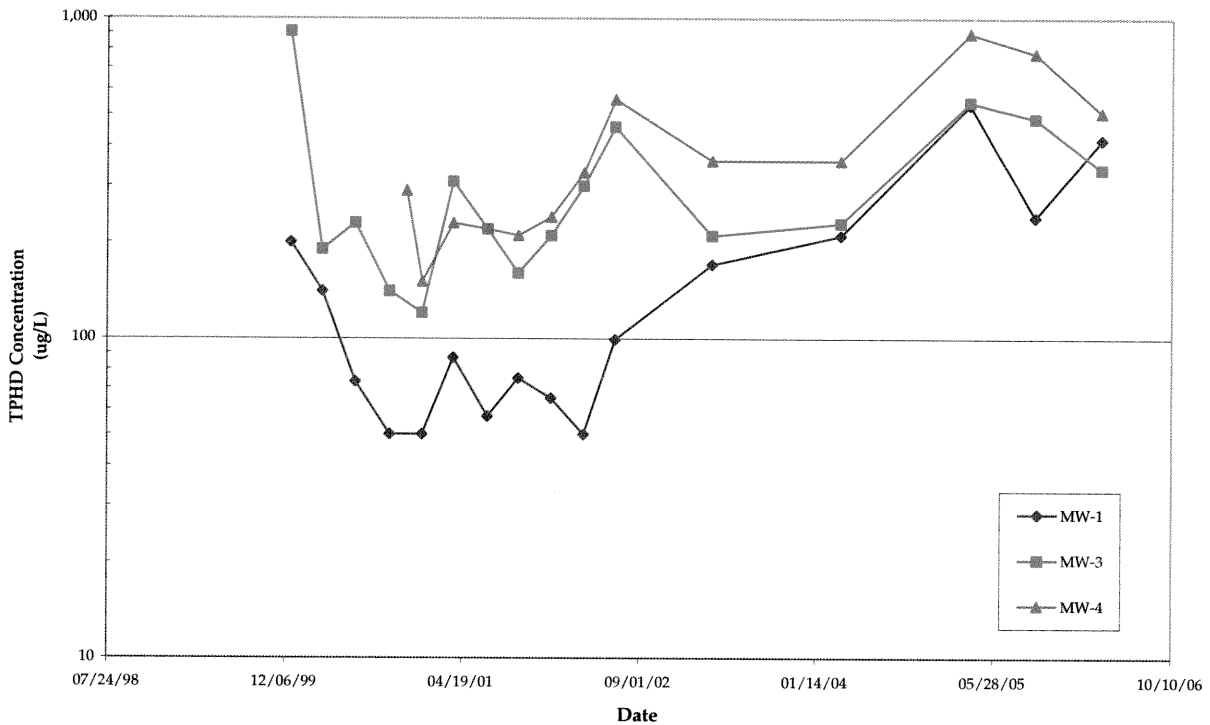




- EXPLANATION**
- MONITORING WELL LOCATION AND DESIGNATION
  - SOIL BORING LOCATION AND DESIGNATION
  - SOIL BORING/WELL POINT LOCATION AND DESIGNATION
  - MIP BORING LOCATION AND DESIGNATION
- |        |              |
|--------|--------------|
| 2'     | SAMPLE DEPTH |
| <1.0   | TPHD         |
| <1.0   | TPHG         |
| <0.005 | BENZENE      |
- RESULTS IN ug/g

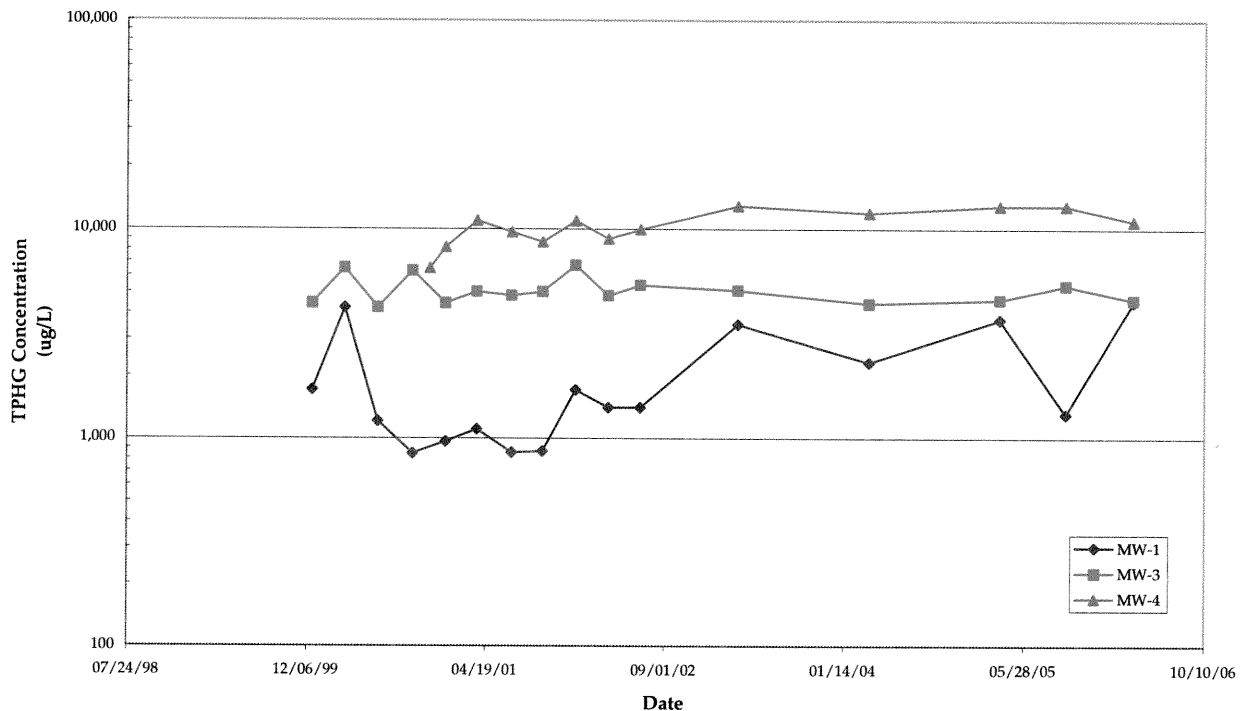


**Figure 6**  
**TPHD Concentration Trends in Groundwater**  
**PALCO Company Garage, Scotia, California**

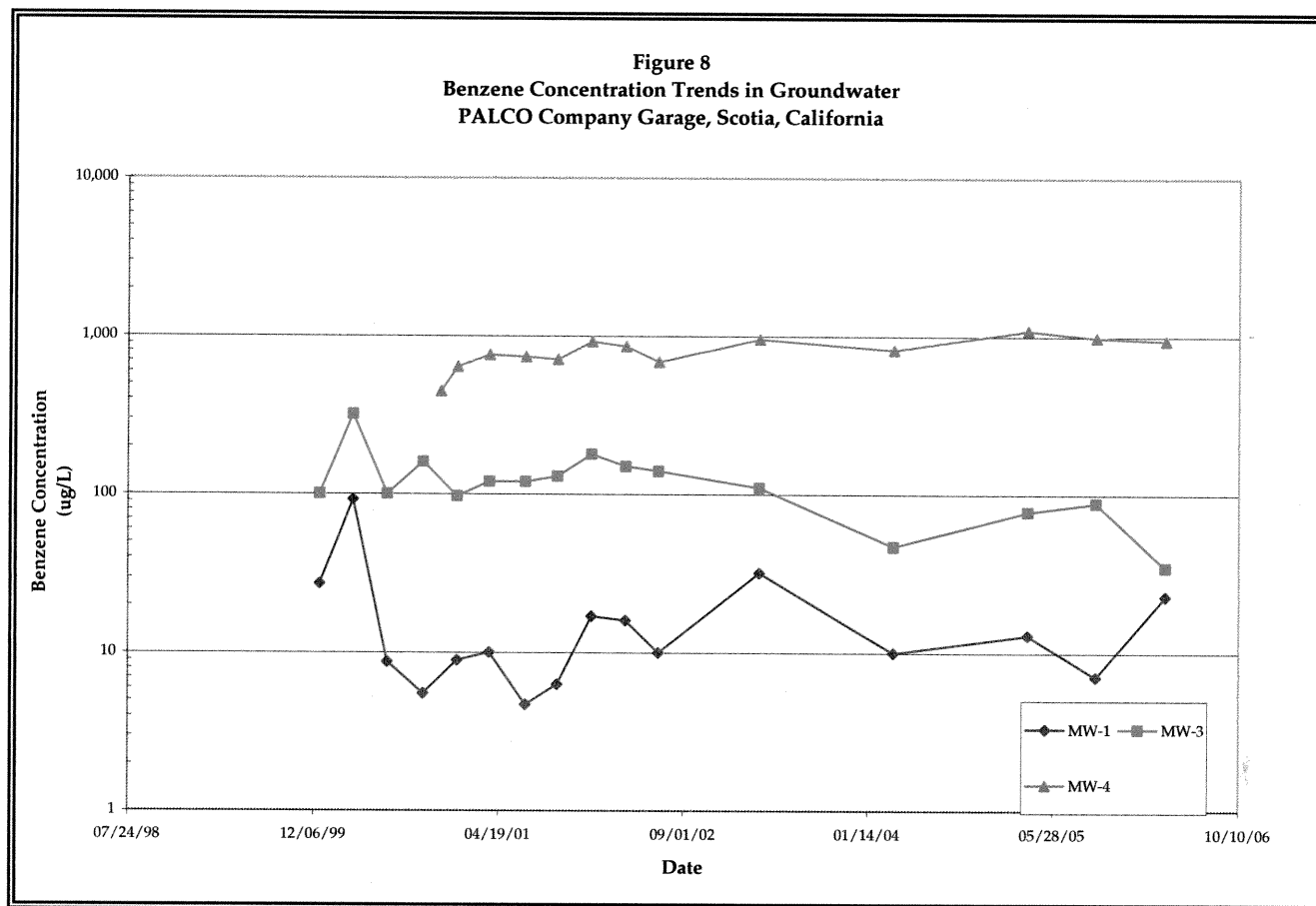


TPHG has historically been detected at concentrations in excess of 100,000 ug/L in groundwater samples at temporary well points WP-2 and WP-3; at concentrations less than 100,000 ug/L but greater than 10,000 ug/L at B-1, WP-4, WP-201, WP-301, WP-302, WP-303, WP-305; at concentrations less than 10,000 ug/L but greater than 1,000 ug/L at well points WP-7 and WP-403; at concentrations less than 1,000 ug/L but greater than the detection limit at well points B-5, WP-202, WP-401, and WP-404; and has not been detected in groundwater samples from temporary well points B-1, B-500, B-501, B-502, B-503, B-504, B-505, B-506, B-507, WP-1, WP-8, WP-9, WP-10, WP-11, and WP-405. Figure 7 shows the historical trends of TPHG concentrations in groundwater at select monitoring wells. The trends indicate that TPHG concentrations are gradually increasing in groundwater.

**Figure 7**  
**TPHG Concentration Trends in Groundwater**  
**PALCO Company Garage, Scotia, California**

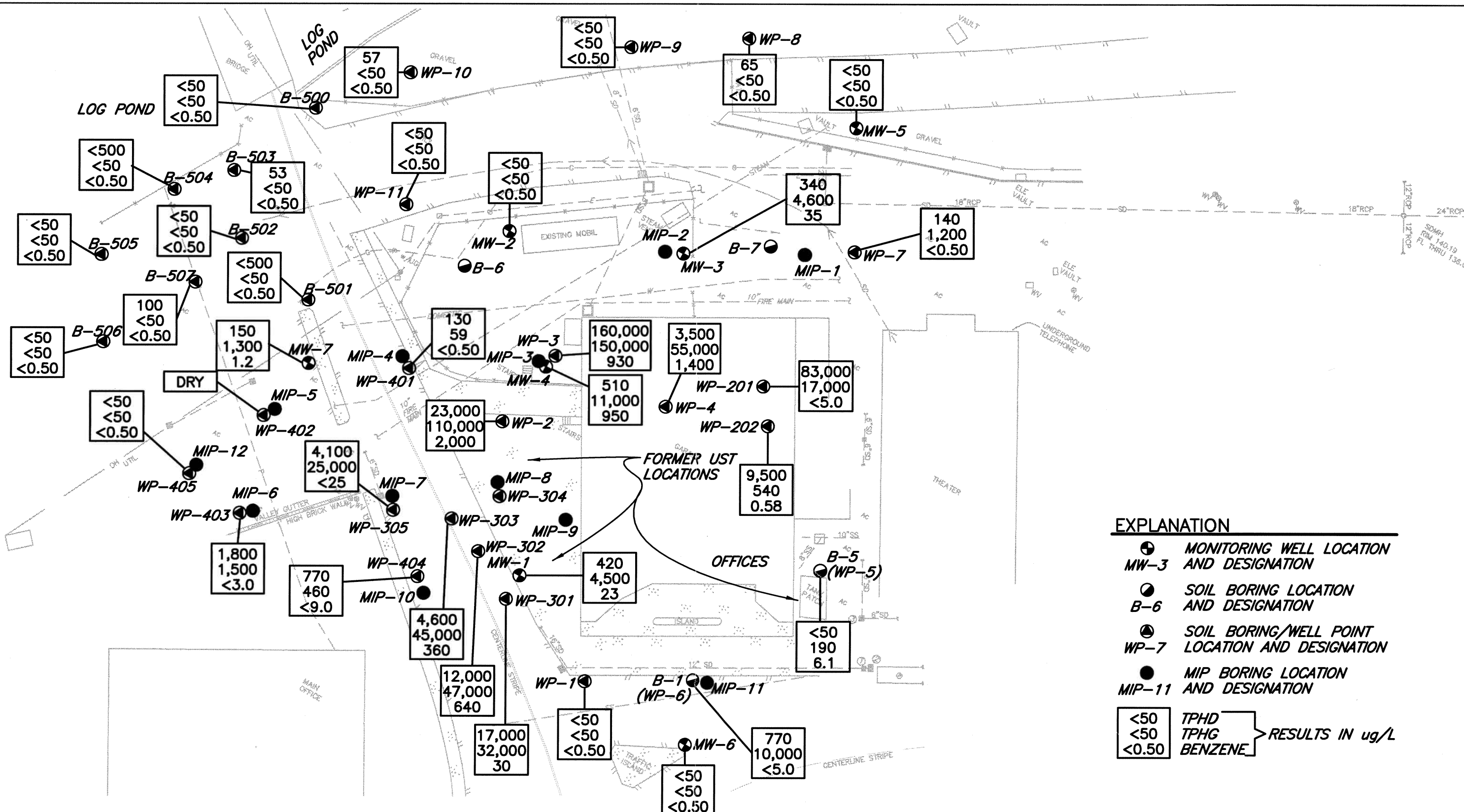


Benzene has historically been detected in groundwater samples at concentrations that exceed 1,000 ug/L at temporary well points WP-2 and WP-4; at concentrations less than 1,000 ug/L but greater than 100 ug/L at well points WP-3, WP-302 and WP-303; at concentrations less than 100 ug/L but greater than 10 ug/L at well point WP-301, at concentrations less than 10 ug/L but greater than the detection limit at well points B-5, and WP-202; and was not detected in groundwater samples from temporary well points B-1, B-500 through B-507, WP-1, WP-7 through WP-11, WP-201, WP-305, WP-401, WP-403, WP-404, and WP-405. Figure 8 shows the historic benzene concentrations in groundwater at select monitoring wells. The trends indicate that benzene concentrations in groundwater are gradually decreasing in the vicinity of monitoring wells MW-1 and MW-3 and gradually increasing in the vicinity of monitoring well MW-4.



TPHMO has been detected in groundwater samples from temporary well points WP-305, WP-404, and B-500 through B-507 at concentrations ranging from 460 ug/L to 23,000 ug/L. However, Total petroleum Hydrocarbons as Motor Oil (TPHMO) has only been detected in monitoring well MW-3 once at a concentration of 230 ug/L. TPHMO is not documented as, and has not been a COC for the Company Garage UST unauthorized release investigation. Historically, dust was controlled on most graveled or earth-graded traveled-ways, County rural roads, and industrial site yard areas in Humboldt County by spreading oil on the traveled surfaces. Subsequent filling of an area or regrading of sites buried much of these former surface areas. TPHMO represents heavier end petroleum hydrocarbon fractions that tend to be less mobile in groundwater. Analytical results of groundwater within the vicinity of the Company Garage have not detected elevated levels of TPHMO. Therefore, TPHMO is not considered a COC at the Company Garage and will not be considered further during the development of this CAP.

Based on the results of extensive groundwater investigations at the site, it appears that the majority of the petroleum-contaminated groundwater is located beneath the Company Garage and in the vicinity of the western former USTs. Quarterly groundwater monitoring events indicate that groundwater in the vicinity of monitoring wells MW-1, MW-3, MW-4, and MW-7 continues to be impacted by petroleum hydrocarbons including TPHD, TPHG, and benzene. Figure 9 shows a summary of groundwater samples collected from the site with the results from the monitoring wells from the most recent groundwater-monitoring event.



- EXPLANATION**
- MONITORING WELL LOCATION AND DESIGNATION
  - SOIL BORING LOCATION AND DESIGNATION
  - SOIL BORING/WELL POINT LOCATION AND DESIGNATION
  - MIP BORING LOCATION AND DESIGNATION
- <50  
 <50  
 <0.50
- RESULTS IN ug/L
- TPHD  
TPHG  
BENZENE

NOTE: MONITORING WELL  
GROUNDWATER ANALYTICAL  
RESULTS FROM MARCH 28, 2006



Groundwater samples from monitoring well MW-4, located downgradient from the western former USTs have historically demonstrated the highest concentrations of COCs. The contaminant plume appears to be defined by groundwater flow direction and subsurface stratigraphy and extends to the west and north of the former UST area. The plume does not appear to extend as far downgradient as monitoring wells MW-2 and MW-5, based on historic monitoring data. Based on MIP boring results completed in 2004, the majority of the COC mass appears to extend from 4 to 15 feet BGS.

## **2.5 Sensitive Receptors**

A sensitive receptor survey was performed for a 1,500-foot radius for the site (SHN, January 2004). Information for the survey was acquired from the Geotracker database maintained by the State of California Water Resources Control Board, United States Geological Survey 7.5 minute series topographic maps, and the PALCO maintenance supervisor.

No water supply wells are located within the search radius.

The Eel River is located on the edge of the search radius, and is not impacted by the site. The former log pond is the only other surface water body within the search radius and, based on existing data, does not appear to be impacted by the site. Water elevations of the log pond are typically higher than those in monitoring well MW-2 indicating that the pond acts as a diversion to shallow groundwater flow (See Figure 3).

## **2.6 Data Limitations**

The lateral extent of contamination appears to be defined at the site. The vertical extent of contamination has not been fully elucidated across the site. However, MIP boring data indicates the average vertical extent of contamination at select locations extends from 4 feet BGS to 15 feet BGS (SHN, December 2004).

## **3.0 Corrective Action Goals**

Remedial action goals for the site are to remediate the soil and groundwater to an extent that there is no threat to human health or the environment as outlined in the RWQCB's basin plan for the north coast region.

Proposed water quality goals for groundwater downgradient of the site are based on water quality goals outlined by the California Regional Water Quality Control Board, Central Valley Region (Marshack, 2003), and are included in Table 2. Water quality goals for TPHG are based on the laboratory detection limit of 50 ug/L.

<p align="center"><b>Table 2</b>  <b>Proposed Water Quality Goals</b>  <b>PALCO Company Garage, Scotia, California</b></p>	
<b>Contaminant</b>	<b>Water Quality Goal (in ug/L)<sup>1</sup></b>
Total Petroleum Hydrocarbons as Gasoline	50 <sup>2</sup>
Total Petroleum Hydrocarbons as Diesel	100 <sup>3</sup>
Benzene	1.0 <sup>4</sup>
Methyl Tertiary-Butyl Ether	5.0 <sup>4</sup>
<p>1. ug/L: micrograms per Liter  2. Based on the laboratory detection limit of 50 ug/L.  3. Based on the taste and odor threshold.  4. Based on the Maximum Contaminant Limit (MCL).</p>	

## 4.0 Monitored Natural Attenuation

Monitored Natural Attenuation (MNA) is typically used as a remedial action in conjunction with active remediation measures. MNA is the reduction in mass or concentration of a chemical in groundwater over time or distance from the source of contamination due to naturally occurring physical, chemical, and biological processes (Barden, 2002). These processes include dispersion (dilution), sorption of contaminants to soil particles, volatilization, biodegradation of contaminants by naturally occurring organisms, or abiotic degradation/transformation (Wiedemeier, 2002). Typically, it is not cost effective to run a complex remediation system to the point of removing all contaminants, and MNA is used to demonstrate if any remaining concentrations of contaminants are decreasing. Source removal and or groundwater treatment are used to reduce the majority of the contaminant mass, and then MNA is used to demonstrate that remaining contaminant concentrations are decreasing over time. Three lines of evidence (Wiedemeier et al., 1999) that can be used to support MNA are:

- documented loss of contaminants in monitoring wells over time,
- contaminant and geochemical analytical data, and
- direct microbiological evidence.

If MNA can be demonstrated (during the two years of post-remediation monitoring) to effectively remediate any remaining dissolved phase plume, and prevent any impacts to receptors, SHN will request closure for the site.

## 5.0 Remedial Option

### 5.1 Preferred Remedial Option

In order to determine a preferred remedial option for the PALCO Company Garage site, SHN prepared an RAFS (SHN, March 2003). The RAFS included a comparative analysis of three remedial options, which included:

1. bioremediation,
2. ozone microsparging, and
3. hydrogen peroxide injection.

A limited excavation of the source area (120 cubic yards) was conducted in 1998 when the USTs were removed. Soil excavation of the source area was not considered in the RAFS due to site constraints, which include:

- a building located over a significant portion of the plume (southern portion of building is an existing office space), and
- underground utilities located above the groundwater plume.

The remedial alternatives were evaluated based on the following criteria:

- **Long-Term Effectiveness**--addresses the risk remaining after the remedial goals are met.
- **Reduction of Toxicity, Mobility, and Volume Through Treatment**--evaluates whether or not the alternative permanently reduces the toxicity, mobility, or volume of contaminated media.
- **Implementability**--addresses the administration and technical feasibility of implementing the alternative.
- **Schedule**--describes how long it will take to implement the remediation and to achieve remedial action goals.
- **Cost**--provides an order of magnitude cost estimate for capital and operational costs.
- **Regulatory Compliance**--addresses whether or not the alternative meets federal and state regulatory criteria.
- **Overall Protection of Human Health and the Environment**--provides an overall health-based summary considering compliance with regulatory criteria, short-term effectiveness, and long-term effectiveness.

Based on the RAFS analysis, In Situ Chemical Oxidation (ISCO) with hydrogen peroxide injection was ranked the most favorable alternative. Chemical oxidation treatment is a proven treatment technology for the degradation of petroleum hydrocarbons, and is easy to implement. Hydrogen peroxide injection also provides the greatest overall safety to employees inside the building and in the immediate vicinity. With hydrogen peroxide injection, the primary treatment consists of ISCO of the source area coupled with biodegradation occurring downgradient of the source area as the hydrogen peroxide breaks down to form oxygen and water.

## 5.2 Proposed Chemical Oxidant Injection

In the RAFS, hydrogen peroxide was selected as the preferred method to remediate residual petroleum hydrocarbons in soil and groundwater at the site. A bench scale treatability study was performed to ensure that the selected option (hydrogen peroxide injection) will work favorably with current site conditions.

On September 5, 2003, SHN collected soil samples from borings WP-101, WP-102, and WP-103 and a groundwater sample from monitoring well MW-4 (Figure 2). Soil and groundwater samples were submitted to Dr. Richard Watts at the Washington State University Chemical Oxidation Research Laboratory and were used to perform a bench scale treatability study. Based on the



results of the treatability study, a peroxide concentration of greater than 6%, with pH adjustment of 3 provided the optimal formula for the destruction of hydrocarbons in site media; however, the cost to implement the remedial action was substantial.

SHN contacted Orin Remediation Technologies (ORIN) of McFarland Wisconsin, to evaluate Dr. Watts' proposed formulation. Orin evaluated the treatability study and prepared a proposal for injection of hydrogen peroxide with a combination of peroxy compounds at a more favorable cost. Hydrogen peroxide injection was proposed at areas of the site with the highest levels of TPH (D&G). Areas with lower contaminant concentrations should be treated with a combination of hydrogen peroxide and sodium persulfate and an oxygen-releasing compound (PermeOx Plus®) to enhance the naturally occurring biodegradation. Orin also recommended that a bench level treatability study be performed in order to determine the ideal treatment dosage and chemistry.

## **5.2.1 Chemical Oxidant Characteristics**

### **5.2.1.1 Peroxy Compounds**

Sodium persulfate ( $\text{Na}_2\text{S}_2\text{O}_8$ ) disassociates in water to form persulfate anions ( $\text{S}_2\text{O}_8^{2-}$ ), which are a more powerful oxidant than hydrogen peroxide (ITRC, 2005). The addition of heat, increase in pH, or addition of a ferrous salt (catalyst) dramatically increases the oxidative strength of persulfate by the generation of sulfate free radicals ( $\text{SO}_4^\cdot$ ), which are similar in oxidative strength to the hydroxyl radical generated using hydrogen peroxide (ITRC, 2005). During the Fenton reaction of hydrogen peroxide and iron, heat is generated, while the production of the sulfate free radical does not produce an exothermic reaction (ITRC, 2005).

PermeOx® Plus is a slow release oxygen compound which will supply oxygen to the indigenous microbial population to increase the rate of natural attenuation of any residual contaminants following contaminant mass reduction by direct oxidation with persulfate.

### **5.2.1.2 Hydrogen Peroxide**

Hydrogen peroxide is a strong oxidant, having an oxidation strength greater than chlorine or potassium permanganate. Hydrogen peroxide also can detoxify a wide range of organic wastes including petroleum hydrocarbon contamination. Given enough hydrogen peroxide, many organic wastes such as petroleum hydrocarbons can be reduced to carbon dioxide and water. Additionally, byproducts of the hydrogen peroxide decomposition are oxygen and water.

Research has shown that hydrogen peroxide at neutral pH, can be converted to a hydroxyl radical on mineral surfaces. Hydroxyl radicals are strong oxidants, second only to fluorine in oxidative strength. Hydroxyl radicals have been documented as successfully degrading petroleum hydrocarbon contamination.

## **5.2.2 Application**

Based on the estimate from ORIN, it is anticipated that approximately 10,050 gallons of a 15% concentration of Peroxy compounds will be injected through 134 locations across the site. Approximately 75 gallons of Peroxy compounds will be injected per injection point by means of temporary stainless steel injection well points (with packers) that will be installed using a Geoprobe®. Injections will be made using approximately a 10-foot grid, with an expected 6-foot

radius of influence. Approximately 1,200 gallons of a 12% concentrations of hydrogen peroxide will be injected through eight drilled temporary injection points. A 15-foot spacing and a 9-foot radius of influence are expected for the permanent injection points, which will be installed using Geoprobe® direct push technology. Approximately 150 gallons of the hydrogen peroxide solution is anticipated per injection point. All injections are anticipated to start at an average depth of 12-feet BGS, injecting from bottom up through the contaminated zone to a depth of 4 feet BGS. The spacing will be modified in the field based on the location of site facilities, underground utilities, and beneath the building based on the locations of underground utilities and concrete supports. The proposed layout for the chemical oxidant injection is shown in Figure 10.

However, in order to determine the effectiveness of the proposed modified treatment chemistry, an additional bench scale treatability study will be necessary. The treatability study will allow confirmation of the dosage that ORIN proposed, or the dosage may be modified based on the results. ORIN also proposed only one injection event. It is likely that more than one injection event will be required to remediate the soil and groundwater at the site.

### **5.2.3 Bench Scale Treatability Study**

The purpose of the bench scale treatability study is to determine the effectiveness of the different remediation solutions. The treatment chemistry for the bench scale study will consist of various combinations of hydrogen peroxide and stabilizers, sodium persulfate activated with calcium peroxide, and sodium persulfate activated with hydrogen peroxide. The mixtures should allow a slower and more controlled reaction between the treatment chemistry and the contaminants. The bench scale treatability study is necessary to determine which concentrations are most effective on treating site soils. A water sample from well MW-4 as well as soil from two borings in the vicinity of the former USTs will be collected and submitted to Dr. Watts for the treatability study.

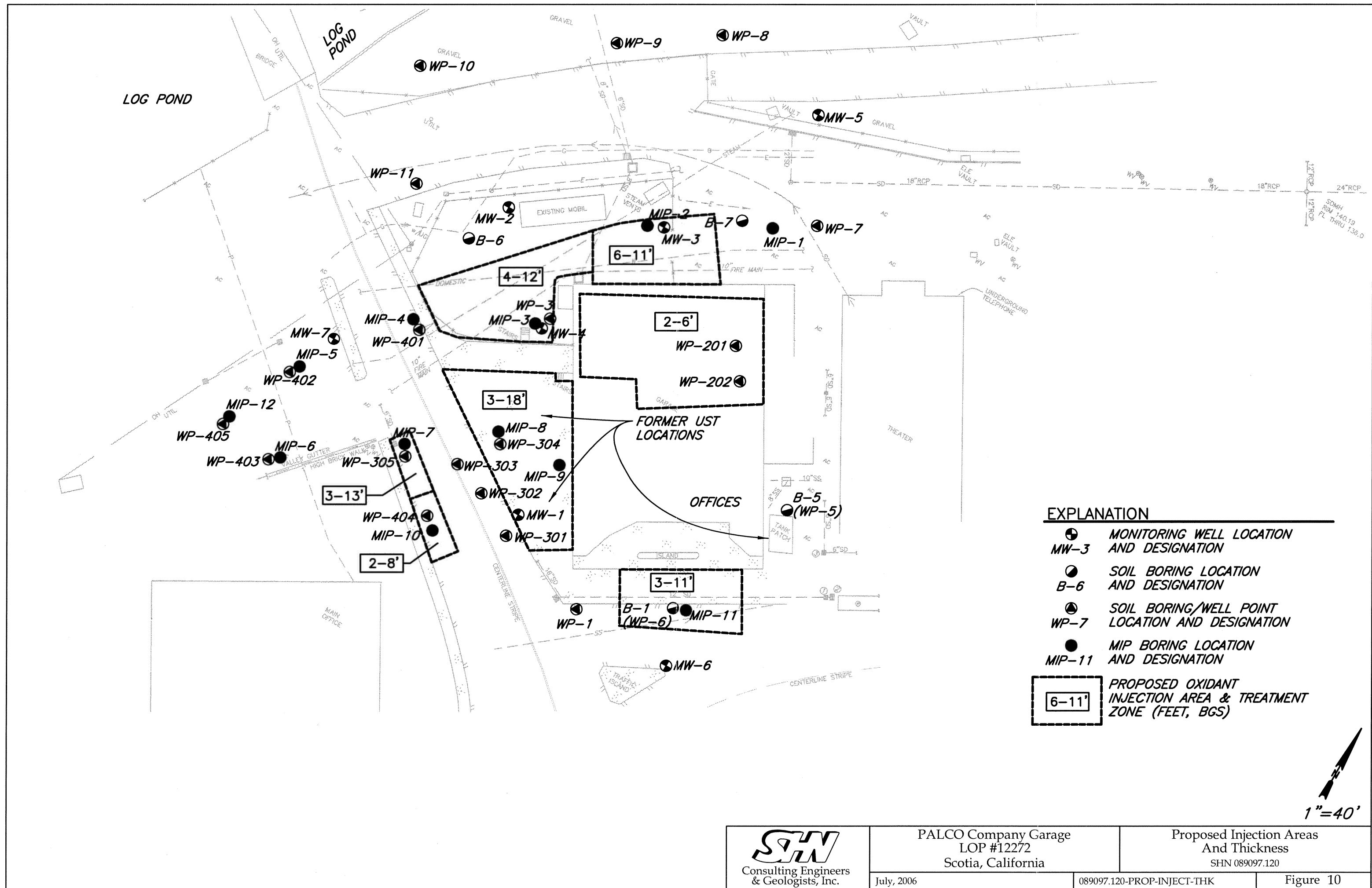
SHN will also collect soil samples from the saturated zone to determine the bulk density and fraction organic carbon content of the soils. This information will be used for future fate and transport calculations.

## **6.0 Post Injection Monitoring**

### **6.1 Groundwater Monitoring**

Following the completion of the treatment activities, it is estimated that the petroleum hydrocarbon concentrations in the groundwater will decline to the proposed water quality goals (Table 2), or demonstrate declining trends that will meet water quality goals within a reasonable timeframe (in approximately four years). During this period, monitoring wells MW-1 through MW-7 will be sampled quarterly for one year and bi-annually for an additional three years. A list of proposed analytes will be included in the ROWD, which will be prepared for submittal to the RWQCB upon the approval of this revised corrective action plan. In addition, parameters for biodegradation will be monitored including the field parameters dissolved oxygen, dissolved carbon dioxide, and the oxidation-reduction potential.

After the treatment chemical injection has been completed, SHN will monitor groundwater and assess if MNA will address the residual hydrocarbon plume or if subsequent oxidant injections will be necessary.



## 6.2 Verification Soil Sampling

SHN will collect post injection soil samples near former soil sample locations B-2, B-3, B-4, and WP-2 as requested by HCDEH (letter dated October 9, 2003). Samples will be delivered under chain-of-custody documentation, and analyzed by a California certified analytical laboratory for TPHD, TPHG, BTEX, and MTBE.

## 7.0 Approvals/Permits

### 7.1 Approvals

The HCDEH is responsible for regulatory oversight and approval of the revised corrective action at the PALCO Company Garage facility. The RWQCB will be charged with approval of the ROWD and preparing the monitoring and reporting program. It is anticipated that the ROWD and monitoring and reporting program will be similar General Waste Discharge Requirements Order No. R1-2004-0020 and Monitoring and Reporting Program R1-2004-0044 for the site, which were rescinded by the RWQCB.

### 7.2 Permitting

Boring permits will be required from the HCDEH for installation of soil borings for the treatability study. Once the volume and concentration of treatment chemical required are estimated at the completion of the treatability studies, a ROWD will be completed. The ROWD will also address public noticing for the project.

## 8.0 Schedule

Upon receipt of approval from the HCDEH to implement the proposed corrective actions, SHN will collect soil samples and a groundwater sample from the site and submit them to Dr. Watts for the preparation of the treatability study. Once the treatability study has been performed and results received, SHN will prepare an ROWD and submit it to the RWQCB, further detailing the injection chemical composition and the proper dosage at each injection point. Upon approval of permits, chemical oxidant injection could occur by winter 2006. A community health and safety plan will be prepared prior to chemical injection.

## 9.0 References Cited

Barden, M.J. (2002). *Natural Attenuation for Remediation of Contaminated Sites #571*. National Groundwater Association Short Course. Westerville: NGWA

California Regional Water Quality Control Board, North Coast Region. (May 14, 2004). General Waste Discharge Requirements Order No. R1-2004-0020. Santa Rosa:RWQCB.

Halford, K.J., and E. L. Kuniansky. (2002). *Documentation of Spreadsheets for the Analysis of Aquifer-Test and Slug-Test Data*. United States Geological Survey Open-File Report 02.197. Carson City:USGS.

ITRC. (2005). *Technical and Regulatory Guidance for In Situ Chemical Oxidation of Contaminated Soil and Groundwater*. Technical and Regulatory Guidance, Interstate Training and Regulatory Council. NR: ITRC.

- Marshack, J. B. (2003). *Beneficial Use-Protective Water Quality Limits for Components of Petroleum Based Fuels*. California Regional Water Quality Control Board, Central Valley Region. Sacramento:RWQCB.
- SHN Consulting Engineers & Geologists, Inc. (January 2000). *Subsurface Investigation Report of Findings, PALCO Company Garage, Scotia, California, HCDEH LOP#12272*. Eureka: SHN.
- . (January 2001). *Site Investigation Report of Findings, PALCO Company Garage, Scotia, California, HCDEH LOP#12272*. Eureka: SHN.
- . (March 2003). *Remedial Action Feasibility Study, PALCO Company Garage, Scotia, California, HCDEH LOP #12272*. Eureka: SHN.
- . (June 2003). *Remedial Action Plan, PALCO Company Garage, Scotia, California, HCDEH LOP#12272*. Eureka: SHN.
- . (December 2003). *Remedial Action Work Plan, PALCO Company Garage, Scotia, California, HCDEH LOP#12272*. Eureka: SHN.
- . (January 2004). "Report of Waste Discharge and Permit Application, PALCO Company Garage, Scotia, California, HCDEH LOP#12272." Eureka: SHN.
- . (May 2004). *Report of Findings and First Quarter 2006 Groundwater Monitoring Report, PALCO Company Garage, Scotia, California, HCDEH LOP#12272*. Eureka: SHN.
- . (December 2004). *Report of Findings for Additional Site Investigation, PALCO Company Garage, Scotia, California, HCDEH LOP#12272*. Eureka: SHN.
- . (May 2005). *Report of Findings and First Quarter 2005 Groundwater Monitoring Report, PALCO Company Garage, Scotia, California, HCDEH LOP#12272*. Eureka: SHN.
- . (April 2006). *Subsurface Investigation Report of Findings, PALCO Company Garage, Scotia, California, HCDEH LOP#12272*. Eureka: SHN.
- Wiedemeier, T.H., J.T. Wilson, D.H. Kampbell, R.N. Miller, J.E. Hansen. (1999). *Technical Protocol for Implementing Intrinsic Remediation with Long-Term Monitoring for Natural Attenuation of Fuel Contamination Dissolved in Groundwater*. San Antonio: Air Force Center for Environmental Excellence, Technology Transfer Division.
- Wiedemeier, T.H. (2002). *Natural Attenuation for Remediation of Contaminated Sites #571*. National Groundwater Association Short Course. Westerville: NGWA.
- U.S. Environmental Protection Agency. (1997). *Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action, and Underground Storage Tank Sites*. United States Environmental Protection Agency, Office of Solid Waste and Emergency Response, Directive 9200.4-17. NR: EPA.



<p align="center"><b>Table A-1</b>  <b>Historic Groundwater Elevation Data</b>  <b>PALCO Company Garage, Scotia, California</b></p>				
<b>Well Number</b>	<b>Date of Reading</b>	<b>Measurement Point Elevation (feet<sup>1</sup>)</b>	<b>Depth to Groundwater (feet)</b>	<b>Groundwater Surface Elevation (feet)</b>
MW-1	12/22/1999	142.64	3.50	139.14
	1/28/2000		3.34	139.30
	2/25/2000		3.21	139.43
	3/22/2000		3.42	139.22
	4/24/2000		3.43	139.21
	5/26/2000		3.51	139.13
	6/23/2000		3.58	139.06
	7/21/2000		3.63	139.01
	8/24/2000		3.57	139.07
	9/28/2000		3.60	139.04
	10/24/2000		4.02	138.62
	11/27/2000		3.66	138.98
	12/29/2000		3.64	139.00
	1/25/2001		3.31	139.33
	2/26/2001		3.18	139.46
	3/26/2001		3.53	139.11
	4/27/2001		3.52	139.12
	5/25/2001		3.52	139.12
	7/2/2001		3.54	139.06
	7/26/2001		3.55	139.09
	8/27/2001		3.59	139.05
	9/26/2001		3.65	138.99
	10/26/2001		3.80	138.84
	11/26/2001		3.31	139.33
	12/27/2001		3.27	139.37
	1/28/2002		3.49	139.15
	2/22/2002		3.39	139.25
	3/29/2002		3.48	139.16
	4/26/2002		3.68	138.96
	5/28/2002		3.56	139.08
	6/26/2002		3.56	139.08
	3/27/2003		3.31	139.33
	3/25/2004		3.48	139.16
	3/23/2005		2.97	139.67
	9/22/2005		3.57	139.07
	3/28/2006		2.92	139.72
MW-2	12/22/1999	137.66	5.51	132.15
	1/28/2000		5.45	132.21
	2/25/2000		5.37	132.29
	3/22/2000		5.72	131.94
	4/24/2000		5.73	131.93
	5/26/2000		5.89	131.77
	6/23/2000		6.16	131.50
	7/21/2000		6.20	131.46

**Table A-1**  
**Historic Groundwater Elevation Data**  
**PALCO Company Garage, Scotia, California**

Well Number	Date of Reading	Measurement Point Elevation (feet <sup>1</sup> )	Depth to Groundwater (feet)	Groundwater Surface Elevation (feet)
MW-2 Cont'd	8/24/2000	137.66	6.22	131.44
	9/28/2000		6.26	131.40
	10/24/2000		6.17	131.49
	11/27/2000		6.04	131.62
	12/29/2000		5.81	131.85
	1/25/2001		5.13	132.53
	2/26/2001		5.28	132.38
	3/26/2001		5.61	132.05
	4/27/2001		5.80	131.86
	5/25/2001		6.06	131.60
	7/2/2001		6.02	131.64
	7/26/2001		6.16	131.50
	8/27/2001		6.25	131.41
	9/26/2001		6.26	131.40
	10/26/2001		6.29	131.37
	11/26/2001		5.30	132.36
	12/27/2001		5.51	132.15
	1/28/2002		5.55	132.11
	2/22/2002		5.47	132.19
	3/29/2002		5.62	132.04
	4/26/2002		5.84	131.82
	5/28/2002		5.87	131.79
	6/26/2002		6.10	131.56
	3/27/2003		5.20	132.46
	3/25/2004		5.75	131.91
	3/23/2005		4.96	132.70
	9/22/2005		6.07	131.59
	3/28/2006		4.99	132.67
MW-3	12/22/1999	138.29	5.31	132.98
	1/28/2000		5.12	133.17
	2/25/2000		5.06	133.23
	3/22/2000		5.33	132.96
	4/24/2000		5.24	133.05
	5/26/2000		5.24	133.05
	6/23/2000		5.31	132.98
	7/21/2000		5.37	132.92
	8/24/2000		5.35	132.94
	9/28/2000		5.39	132.90
	10/24/2000		5.37	132.92
	11/27/2000		5.44	132.85
	12/29/2000		5.44	132.85
	1/25/2001		4.79	133.50
	2/26/2001		5.02	133.27
	3/26/2001		5.38	132.91



<p align="center"><b>Table A-1</b>  <b>Historic Groundwater Elevation Data</b>  <b>PALCO Company Garage, Scotia, California</b></p>				
<b>Well Number</b>	<b>Date of Reading</b>	<b>Measurement Point Elevation (feet<sup>1</sup>)</b>	<b>Depth to Groundwater (feet)</b>	<b>Groundwater Surface Elevation (feet)</b>
MW-3 Cont'd	4/27/2001	138.29	5.35	132.94
	5/25/2001		5.42	132.87
	7/2/2001		5.34	132.95
	7/26/2001		5.47	132.82
	8/27/2001		5.45	132.84
	9/26/2001		5.49	132.80
	10/26/2001		5.48	132.81
	11/26/2001		5.08	133.21
	12/27/2001		5.24	133.05
	1/28/2002		5.23	133.06
	2/22/2002		5.11	133.18
	3/29/2002		5.24	133.05
	4/26/2002		5.21	133.08
	5/28/2002		5.21	133.08
	6/26/2002		5.27	133.02
	3/27/2003		4.87	133.42
	3/25/2004		5.00	133.29
	3/23/2005		4.63	133.66
	9/22/2005		5.37	132.92
	3/28/2006		4.55	133.74
MW-4	11/27/2000	139.74	5.23	134.51
	12/29/2000		5.07	134.67
	1/25/2001		4.73	135.01
	2/26/2001		4.55	135.19
	3/26/2001		4.95	134.79
	4/27/2001		4.78	134.96
	5/25/2001		5.21	134.53
	7/2/2001		5.03	134.71
	7/26/2001		5.22	134.52
	8/27/2001		5.20	134.54
	9/26/2001		5.22	134.52
	10/26/2001		5.24	134.50
	11/26/2001		4.83	134.91
	12/27/2001		4.64	135.10
	1/28/2002		4.90	134.84
	2/22/2002		4.73	135.01
	3/29/2002		4.89	134.85
	4/26/2002		4.97	134.77
	5/28/2002		4.86	134.88
	6/26/2002		5.02	134.72
	3/27/2003		4.51	135.23
	3/25/2004		4.85	134.89
	3/23/2005		4.37	135.37

**Table A-1**  
**Historic Groundwater Elevation Data**  
**PALCO Company Garage, Scotia, California**

Well Number	Date of Reading	Measurement Point Elevation (feet <sup>1</sup> )	Depth to Groundwater (feet)	Groundwater Surface Elevation (feet)
MW-4 Cont'd	9/22/2005	139.74	4.91	134.83
	3/28/2006		4.23	135.51
MW-5	3/25/2004	136.00	4.35	131.65
	3/23/2005		3.92	132.08
	9/22/2005		4.47	131.53
	3/28/2006		3.90	132.10
MW-6	3/25/2004	146.95	5.09	141.86
	3/23/2005		4.87	142.08
	9/22/2005		5.05	141.90
	3/28/2006		4.85	142.10
MW-7	3/23/2005	137.69	6.23	131.46
	9/22/2005		6.92	130.77
	3/28/2006		6.39	131.30
Pond Surface Elevation	4/27/2001	134.49	2.27	132.22
	5/25/2001		2.28	132.21
	7/26/2001		2.37	132.12
	8/27/2001		2.37	132.12
	9/26/2001		2.34	132.15
	10/26/2001		2.36	132.13
	11/26/2001		2.24	132.25
	12/27/2001		2.30	132.19
	1/28/2002		2.29	132.20
	2/22/2002		2.27	132.22
	3/26/2002		2.30	132.19
	3/29/2002		2.33	132.16
	4/26/2002		2.34	132.15
	5/28/2002		2.32	132.17
	6/26/2002		2.33	132.16
	3/27/2003		2.21	132.28
	3/25/2004		2.42	132.07
	3/23/2005		2.32	132.17
	9/22/2005		2.47	132.02
	3/28/2006		2.33	132.16

1. Elevation Datum NGVD29 (National Geodetic Vertical Datum 1929)

Table A-2

## Historic Groundwater Analytical Results

PALCO Company Garage, Scotia, California

(in ug/L<sup>1</sup>)

Sample Location	Date	TPHMO <sup>2</sup>	TPHD <sup>2</sup>	TPHC <sup>3</sup>	B <sup>4</sup>	T <sup>4</sup>	E <sup>4</sup>	X <sup>4</sup>	MTBE <sup>5</sup>	DIPE <sup>5</sup>	ETBE <sup>5</sup>	TAME <sup>5</sup>	TBA <sup>5</sup>	Methanol <sup>5</sup>	Ethanol <sup>5</sup>	Pb <sup>6</sup>
MW-1	12/23/99	NA <sup>7</sup>	200	1,700	27	6.3	58	7.6	1.1	<0.50 <sup>8</sup>	<0.50	<0.50	<5.0	<5.0	<5.0	<5.0
	03/22/00	NA	140	4,200	92	49	130	14	<100	NA	NA	NA	NA	NA	NA	NA
	06/23/00	NA	73	1,200	8.7	2.4	19	3.2	<1.0	<0.50	<0.50	<0.50	<5.0	<5.0	<5.0	<20
	09/28/00	NA	50	840	5.5	1.3	5.1	1.9	<0.50	<0.50	<0.50	<0.50	<5.0	<100	<5.0	<20
	12/29/00	NA	50	960	8.9	1.9	11	2.7	0.53	<0.50	<0.50	<0.50	<5.0	<50	<5.0	<20
	03/26/01	NA	87	1,100	10	2.2	13	2.9	0.51	<0.50	<0.50	<0.50	<5.0	<50	<5.0	<20
	07/02/01	NA	57	850	4.7	1.3	3.2	1.7	<0.50	<0.50	<0.50	<0.50	<5.0	<50	<5.0	<20
	09/26/01	NA	75	860	6.3	1.5	3.4	1.9	<0.50	<0.50	<0.50	<0.50	<5.0	<50	<5.0	<20
	12/27/01	NA	65	1,700	17	3.4	13	3.0	1.1	<1.0	<1.0	<1.0	<5.0	<50	<5.0	<20
	03/29/02	NA	50	1,400	16	2.9	10	2.6	0.78	<1.0	<1.0	<1.0	<5.0	<50	<5.0	<10
	06/26/02	NA	99	1,400	10	2.7	6.3	3.46	0.52	<1.0	<1.0	<1.0	<5.0	<50	<5.0	<10
	03/27/03	NA	170	3,500	32	4.1	18	5.04	0.80	<1.0	<1.0	<1.0	<10	<50	<5.0	<10
	03/25/04	<170	210	2,300	10	3.4	6.3	4.2	<1.0	<1.0	<1.0	<1.0	<20	NA	NA	<10
	03/23/05	NA	540	3,700	13	4.8	13	6.6	<1.0	<1.0	<1.0	<1.0	<10	NA	NA	NA
	09/22/05	NA	240	1,300	7.1	1.8	3.9	1.9	<1.0	<1.0	<1.0	<1.0	<10	NA	NA	NA
	03/28/06	NA	420	4,500	23	7.2	25	8.8	<1.0	<1.0	<1.0	<1.0	<10	NA	NA	NA
MW-2	12/23/99	NA	<50	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<50	<5.0	<5.0
	03/22/00	NA	<50	<50	<0.50	<0.50	<0.50	<0.50	<3.0	NA	NA	NA	NA	NA	NA	NA
	06/23/00	NA	<50	<50	<0.50	<0.50	<0.50	<0.50	<0.50	NA	NA	NA	NA	NA	NA	NA
	09/28/00	NA	<50	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<50	<5.0	<20
	12/29/00	NA	<50	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<50	<5.0	<20
	03/26/01	NA	<50	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<50	<5.0	<20
	07/02/01	NA	<50	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<50	<5.0	<20
	09/26/01	NA	<50	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<50	<5.0	<20
	12/27/01	NA	<50	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<5.0	<50	<5.0	<20
	03/29/02	NA	<50	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<50	<5.0	<10
	06/26/02	NA	<50	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<5.0	<50	<5.0	<10
	03/27/03	NA	<50	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<5.0	<50	<5.0	<10
	03/25/04	<170	<50	<50	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<20	NA	NA	<10
	03/23/05	NA	<50	<50	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<10	NA	NA	NA
	09/22/05	NA	<50	<50	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<10	NA	NA	NA
	03/28/06	NA	<50	<50	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	<10	NA	NA	NA

Table A-2 Historic Groundwater Analytical Results PALCO Company Garage, Scotia, California (in ug/L <sup>1</sup> )																
Sample Location	Date	TPHMO <sup>2</sup>	TPHD <sup>2</sup>	TPHC <sup>3</sup>	B <sup>4</sup>	T <sup>4</sup>	E <sup>4</sup>	X <sup>4</sup>	MTBE <sup>5</sup>	DIPE <sup>5</sup>	ETBE <sup>5</sup>	TAME <sup>5</sup>	TBA <sup>5</sup>	Methanol <sup>5</sup>	Ethanol <sup>5</sup>	Pb <sup>6</sup>
MW-3	12/23/99	NA	910	4,400	100	18	61	34.9	<0.50	<0.50	<0.50	<0.50	5.9	<50	<20	<5.0
	03/22/00	NA	190	6,500	320	87	91	69	<200	NA	NA	NA	NA	NA	NA	NA
	06/23/00	NA	230	4,200	100	15	39	31	<1.0	<0.50	<0.50	<0.50	5.6	<50	<50	<20
	09/28/00	NA	140	6,300	160	20	30	40	<0.50	<0.50	<0.50	<0.50	7.6	<50	<5.0	<20
	12/29/00	NA	120	4,400	97	13	43	27	<0.50	<0.50	<0.50	<0.50	7.4	<50	<5.0	<20
	03/26/01	NA	310	5,000	120	18	44	33	<1.0	<1.0	<1.0	<1.0	<10	<100	<10	<20
	07/02/01	NA	220	4,800	120	17	21	29	<1.0	<1.0	<1.0	<1.0	<10	<100	<10	<20
	09/26/01	NA	160	5,000	130	17	22	32	<1.0	<1.0	<1.0	<1.0	<10	<100	<10	<20
	12/27/01	NA	210	6,700	180	20	60	32.7	0.95	<1.0	<1.0	<1.0	14	<50	<5.0	<20
	03/29/02	NA	300	4,800	150	20	37	27.4	<1.0	<2.0	<2.0	<2.0	<20	<50	<5.0	<10
	06/26/02	NA	460	5,400	140	28	35	46.9	<1.0	<2.0	<2.0	<2.0	<20	<50	<5.0	<10
	03/27/03	NA	210	5,100	110	16	34	22.2	<1.0	<2.0	<2.0	<2.0	<20	<50	<5.0	<10
	03/25/04	230	230	4,400	47	14	33	20.8	<4.0	<1.0	<1.0	<1.0	<20	NA	NA	<10
	03/23/05	NA	550	4,600	78	15	31	19.6	<10	<10	<10	<10	<10	NA	NA	NA
	09/22/05	NA	490	5,400	89	17	15	21.7	<3.0	<1.0	<1.0	<1.0	<10	NA	NA	NA
	03/28/06	NA	340	4,600	35	11	28	19.1	<1.0	<1.0	<1.0	<1.0	<10	NA	NA	NA
MW-4	11/14/00	NA	290	6,500	450	44	130	110	7.6	<2.0	<2.0	<2.0	27	<200	<20	<20
	12/29/00	NA	150	8,200	640	53	190	100	6.0	<1.0	<1.0	<1.0	23	<100	<10	<20
	03/26/01	NA	230	11,000	760	75	240	120	5.3	<2.0	<2.0	<2.0	28	<200	<20	<20
	07/02/01	NA	220	9,700	740	72	180	110	5.9	<5.0	<5.0	<5.0	<50	<500	<50	<20
	09/26/01	NA	210	8,700	710	63	160	100	5.3	<2.5	<2.5	<2.5	<25	<250	<25	<20
	12/27/01	NA	240	11,000	920	57	160	78	9.6	<5.0	<5.0	<5.0	<50	<50	<5.0	<20
	03/29/02	NA	330	9,000	860	68	160	77	5.4	<10	<10	<10	<100	<50	<5.0	<10
	06/26/02	NA	560	10,000	690	69	160	101	5.9	<5.0	<5.0	<5.0	<50	<50	<5.0	<10
	03/27/03	NA	360	13,000	960	78	200	98	<5.0	<10	<10	<10	<100	<50	<5.0	<10
	03/25/04	<170	360	12,000	820	70	120	71	<3.5	<1.0	<1.0	<1.0	<20	NA	NA	<10
	03/23/05	NA	900	13,000	1,100	73	150	73	<8.0	<1.0	<1.0	<1.0	<32	NA	NA	NA
	09/22/05	NA	780	13,000	990	66	95	73	<6.0	<1.0	<1.0	<1.0	<25	NA	NA	NA
	03/28/06	NA	510	11,000	950	88	170	94	<5.0	<1.0	<1.0	<1.0	<30	NA	NA	NA

Table A-2

Historic Groundwater Analytical Results  
PALCO Company Garage, Scotia, California

(in ug/L<sup>1</sup>)

Sample Location	Date	TPHMO <sup>2</sup>	TPHD <sup>2</sup>	TPHC <sup>3</sup>	B <sup>4</sup>	T <sup>4</sup>	E <sup>4</sup>	X <sup>4</sup>	MTBE <sup>5</sup>	DIPE <sup>5</sup>	ETBE <sup>5</sup>	TAME <sup>5</sup>	TBA <sup>5</sup>	Methanol <sup>5</sup>	Ethanol <sup>5</sup>	Pb <sup>6</sup>
MW-5	03/25/04	<170	<50	<50	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<20	NA	NA	<10
	03/23/05	NA	<50	<50	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<10	NA	NA	NA
	09/22/05	NA	<50	<50	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<10	NA	NA	NA
	03/28/06	NA	<50	<50	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<10	NA	NA	NA
MW-6	03/25/04	<170	64	<50	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<20	NA	NA	<10
	03/23/05	NA	<50	<50	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<10	NA	NA	NA
	09/22/05	NA	<50	<50	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<10	NA	NA	NA
	03/28/06	NA	<50	<50	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<10	NA	NA	NA
MW-7	03/24/05	<170	200	1,500	3.5	2.6	2.0	3.23	<1.0	<1.0	<1.0	<1.0	<10	NA	NA	<10
	09/22/05	NA	230	1,600	<0.50	1.4	0.74	2.71	<1.0	<1.0	<1.0	<1.0	<10	NA	NA	NA
	03/28/06	NA	150	1,300	1.2	1.4	0.83	2.48	<1.0	<1.0	<1.0	<1.0	<10	NA	NA	NA
	12/23/1999	NA	<50	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<50	<50	<50	770
WP-1	12/23/1999	NA	<50	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<50	<50	<50	770
WP-2	12/23/1999	NA	23,000	110,000	2,000	920	4,300	16,800	46	<20	<20	<20	<200	<2,000	520	1,900
WP-3	12/23/1999	NA	160,000	150,000	930	260	2,400	300	<100	<100	<100	<100	<1,000	<10,000	2,500	1,800
WP-4	12/23/1999	NA	3,500	55,000	140	930	2,900	8,500	<10	<10	<10	<10	<100	<1,000	<100	630
WP-5	12/23/99	NA	<50	190	6.1	2.9	9.8	26.6	<0.50	<0.50	<0.50	<0.50	<50	<50	<50	240
WP-6	12/23/99	NA	770	10,000	<5.0	10	520	272	<5.0	<5.0	<5.0	<5.0	<50	<500	<50	1,000
WP-7	11/14/00	NA	140	1200	<0.50	<0.50	<0.50	<0.50	0.57	<0.50	<0.50	<0.50	<0.50	<50	<50	<20
WP-8	11/15/00	NA	65	<50	<0.50	<0.50	<0.50	<0.50	0.57	2.5	<0.50	<0.50	<0.50	<50	<50	<20
WP-9	11/16/00	NA	<50	<50	<0.50	<0.50	<0.50	<0.50	0.68	<0.50	<0.50	<0.50	<0.50	<50	<50	<20
WP-10	11/17/00	NA	57	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<50	<50	<20
WP-11	11/18/00	NA	<50	<50	<0.50	<0.50	<0.50	<0.50	0.90	<0.50	<0.50	<0.50	<0.50	<50	<50	<20
WP-201	1/29/2004	3,200	83,000	17,000	<5.0	7.6	100	17	<1.0	<1.0	<1.0	<1.0	<20	NA	NA	NA
WP-202	1/29/2004	4,200	9,500	540	0.58	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<1.0	<20	NA	NA	NA
WP-301	3/17/2004	4,300	17,000	32,000	30	31	190	35	<1.0	<1.0	<1.0	<1.0	<20	NA	NA	NA
WP-302	3/17/2004	6,200	12,000	47,000	640	110	810	259	<1.0	<1.0	<1.0	<1.0	<20	NA	NA	NA
WP-303	3/17/2004	3,800	4,600	45,000	360	110	3,000	322	<1.0	<1.0	<1.0	<1.0	<20	NA	NA	NA
WP-305	3/17/2004	9,800	4,100	25,000	<25	59	1,300	1,810	<1.0	<1.0	<1.0	<1.0	<20	NA	NA	NA
WP-401	9/24/2004	1,600	130	59	<0.50	<1.0	<0.50	<0.50	4.7	NA	NA	NA	NA	NA	NA	NA
WP-403	9/25/2004	1,000	1,800	1,500	<3.0	<25	<9.0	<7.0	<8.0	NA	NA	NA	NA	NA	NA	NA
WP-404	9/26/2004	23,000	770	460	<9.0	<15	<0.50	<2.0	<14	NA	NA	NA	NA	NA	NA	NA
WP-405	9/27/2004	<170	<50	<50	<0.50	0.63	<0.50	<0.50	<9.0	NA	NA	NA	NA	NA	NA	NA
B-500	3/9/2006	460	<50	<50	<0.50	<0.50	<0.50	<0.50	<3.0	NA	NA	NA	NA	NA	NA	NA
B-501	3/9/2006	4,000	<500	<50	<0.50	<0.50	<0.50	<0.50	<3.0	NA	NA	NA	NA	NA	NA	NA
B-502	3/9/2006	480	<50	<50	<0.50	0.96	<0.50	0.96	<3.0	NA	NA	NA	NA	NA	NA	NA
B-503	3/9/2006	650	536	<50	<0.50	0.82	<0.50	<0.50	<3.0	NA	NA	NA	NA	NA	NA	NA
B-504	3/9/2006	14,000	<500	<50	<0.50	<0.50	<0.50	<0.50	<3.0	NA	NA	NA	NA	NA	NA	NA
B-505	3/9/2006	720	<50	<50	<0.50	<0.50	<0.50	<0.50	<3.0	NA	NA	NA	NA	NA	NA	NA
B-506	3/9/2006	690	<50	<50	<0.50	<0.50	<0.50	<0.50	<3.0	NA	NA	NA	NA	NA	NA	NA

Table A-2																
Historic Groundwater Analytical Results																
PALCO Company Garage, Scotia, California																
(in ug/L <sup>1</sup> )																
Sample Location	Date	TPHMO <sup>2</sup>	TPHD <sup>2</sup>	TPHG <sup>3</sup>	B <sup>4</sup>	T <sup>4</sup>	E <sup>4</sup>	X <sup>4</sup>	MTBE <sup>5</sup>	DIPE <sup>5</sup>	ETBE <sup>5</sup>	TAME <sup>5</sup>	TBA <sup>5</sup>	Methanol <sup>5</sup>	Ethanol <sup>5</sup>	Pb <sup>6</sup>
B-507	3/9/2006	460	100	<50	<0.50	<0.50	<0.50	<0.50	<3.0	NA	NA	NA	NA	NA	NA	NA
1. ug/L: micrograms per Liter																
2. Total Petroleum Hydrocarbons as Motor Oil (TPHMO) and as Diesel (TPHD) analyzed in general accordance with EPA Method No. 8015B.																
3. Total Petroleum Hydrocarbons as Gasoline (TPHG) analyzed in general accordance with EPA Method No. 8260B.																
4. Benzene (B), Toluene (T), Ethylbenzene (E), and total Xylenes (X) analyzed in general accordance with EPA Method No. 8260B.																
5. Methyl Tertiary-Butyl Ether (MTBE), Diisopropyl Ether (DIPE), Ethyl Tertiary-Butyl Ether (ETBE), Tertiary-Amyl Methyl Ether (TAME), Tertiary-Butyl Alcohol (TBA), Methanol, and Ethanol analyzed in general accordance with EPA Method No. 8260B.																
6. Pb: Lead analyzed in general accordance with EPA Method No. 200.9.																
7. NA: Not Analyzed																
8. <: Denotes a value that is "less than" the method detection limit.																

Table A-3

**Historical Volatile Organic Compound Analysis<sup>1</sup>**  
**PALCO Company Garage, Scotia, California**  
(in ug/L)<sup>2</sup>

Sample Location	Date	2,2-Dichloro-propane	Isopropyl-benzene	n-Propyl-benzene	1,3,5-Trimethyl-benzene	tert-Butyl-benzene	1,2,4-Trimethyl-benzene	Sec-Butyl-benzene	4-Isopropyl-toluene	n-Butyl-benzene	Naphthalene
MW-1	12/23/99	NA <sup>3</sup>	16	35	4.7	2.0	<0.50 <sup>4</sup>	2.4	0.66	12	11
	03/25/04	2.3	28	60	<1.0	4.6	<1.0	4.9	2.2	7.3	3.1
MW-2	12/23/99	NA	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	03/25/04	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0
MW-3	12/23/99	NA	70	120	15	8.1	2.8	6.1	2.0	19	16
	03/25/04	6.4	75	120	4.2	11	4.1	8.5	4.5	11	8.5
MW-4	03/25/04	17	110	170	14	8.2	2.3	9.1	7.0	13	23
MW-5	03/25/04	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0
MW-6	03/25/04	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0
MW-7	03/24/05	<5.0	7.9	16	<1.0	7.9	<1.0	<4.0	<1.0	2.9	<2.0

1. Only compounds that were detected in site groundwater are shown.

2. ug/L: micrograms per Liter.

3. NA: Not Analyzed.

4. <: Denotes a value that is "less than" the method detection limit.

**Table A-4**  
**Historic Geochemical Parameters**  
**PALCO Company Garage, Scotia, California**

Sample Location	Sample Date	DO <sup>1</sup> (ppm) <sup>2</sup>	DCO <sub>2</sub> <sup>3</sup> (ppm)	ORP <sup>4</sup> (mV) <sup>5</sup>
MW-1	03/26/01	1.04	150	54
	07/02/01	0.18	225	26
	09/26/01	0.14	200	179
	12/27/01	0.52	140	138
	03/29/02	0.16	180	102
	06/26/02	0.27	200	119
	03/27/03	1.75	190	227
	03/25/04	0.93	175	261
	03/23/05	0.68	170	-83
	09/22/05	0.94	200	-120
	03/28/06	0.87	200	-145
MW-2	03/26/01	0.80	140	98
	07/02/01	0.10	200	13
	09/26/01	0.10	140	158
	12/27/01	0.27	100	154
	03/29/02	0.67	120	98
	06/26/02	0.22	120	166
	03/27/03	0.41	100	214
	03/25/04	0.60	180	276
	03/23/05	0.70	160	-48
	09/22/05	1.08	140	-64
	03/28/06	1.13	125	-144
MW-3	03/26/01	0.97	200	0
	07/02/01	0.13	400	-10
	09/26/01	0.38	220	17
	12/27/01	0.26	200	75
	03/29/02	0.29	170	46
	06/26/02	0.61	230	50
	03/27/03	1.06	80	194
	03/25/04	0.89	250	168
	03/23/05	0.91	90	-90
	09/22/05	1.28	180	-138
	03/28/06	0.85	150	-142



**Table A-4**  
**Historic Geochemical Parameters**  
**PALCO Company Garage, Scotia, California**

Sample Location	Sample Date	DO <sup>1</sup> (ppm) <sup>2</sup>	DCO <sub>2</sub> <sup>3</sup> (ppm)	ORP <sup>4</sup> (mV) <sup>5</sup>
MW-4	03/26/01	0.85	350	14
	07/02/01	0.08	460	11
	09/26/01	0.10	460	-0.12
	12/27/01	0.30	250	100
	03/29/02	0.46	330	45
	06/26/02	0.24	300	118
	03/27/03	0.30	300	179
	03/25/04	0.53	350	118
	03/23/05	0.66	350	-111
	09/22/05	0.90	350	-145
	03/28/06	0.82	350	-139
MW-5	03/25/04	0.65	170	263
	03/23/05	1.76	50	13
	09/22/05	2.05	120	-48
	03/28/06	0.99	75	-77
MW-6	03/25/04	2.16	90	285
	03/23/05	0.72	70	108
	09/22/05	0.99	80	32
	03/28/06	0.88	95	0
MW-7	03/23/05	0.72	50	-62
	09/22/05	1.02	180	-131
	03/28/06	0.68	85	-143

1. DCO<sub>2</sub>: Dissolved Carbon Dioxide, field measured using a field test kit.
2. DO: Dissolved Oxygen, field measured using portable instrumentation.
3. ppm: parts per million
4. ORP: Oxidation-Reduction Potential (Eh) measured using portable instrumentation.
5. mV: millivolts.

Table A-5																				
Historic CAM 17 Metals in Groundwater																				
PALCO Company Garage, Scotia, California																				
(in ug/L) <sup>1</sup>																				
Sample Location	Date	As <sup>2</sup>	Sb <sup>2</sup>	Ba <sup>2</sup>	Be <sup>2</sup>	Cd <sup>2</sup>	Cr <sup>2</sup>	Co <sup>2</sup>	Cu <sup>2</sup>	Fe <sup>2</sup>	Mn <sup>2</sup>	Mo <sup>2</sup>	Ni <sup>2</sup>	Ag <sup>2</sup>	V <sup>2</sup>	Zn <sup>2</sup>	Pb <sup>2</sup>	Hg <sup>2</sup>	Se <sup>2</sup>	Tl <sup>2</sup>
MW-1	03/25/04	16	<50 <sup>3</sup>	43	<1.0	<10	<10	<10	<10	17,000	2,600	<20	<20	<10	<10	<10	<20	<10	<1.0	<10
MW-2	03/25/04	<10	<50	27	<1.0	<10	<10	<10	<10	6,900	1,500	<20	<20	<10	<10	<10	<20	<10	<1.0	<10
MW-3	03/25/04	20	<50	6.4	<1.0	<10	<10	<10	<10	14,000	2,000	<20	<20	<10	<10	<10	<20	<10	<1.0	<10
MW-4	03/25/04	19	<50	31	<1.0	<10	<10	<10	<10	38,000	5,700	<20	<20	<10	<10	<10	<20	<10	<1.0	<10
MW-5	03/25/04	19	<50	17	<1.0	<10	<10	<10	<10	7,000	3,200	<20	<20	<10	<10	<10	<20	<10	<1.0	<10
MW-6	03/25/04	<10	<50	6.2	<1.0	<10	<10	<10	<10	<100	250	<20	<20	<10	<10	<10	<20	<10	<1.0	<10
MW-7	03/24/05	40	<50	14	<1.0	<10	<10	<10	<10	7,600	3,500	30	<20	<10	<10	<10	<20	<10	<1.0	<10
1. ug/L: micrograms per Liter																				
2. As: Arsenic, Sb: Antimony, Ba: Barium, Be: Beryllium, Cd: Cadmium, Cr: Chromium, Co: Cobalt, Cu: Copper, Fe: Iron, Mn: Manganese, Mo: Molybdenum, Ni: Nickel, Ag: Silver, V: Vanadium, Zn: Zinc, Pb: Lead, Hg: Mercury, Se: Selenium, Tl: Thallium																				
3. <: Denotes a value that is "less than" the method detection limit.																				

Table A-6											
Additional Groundwater Analytical Parameters, March 25, 2004											
PALCO Company Garage, Scotia, California											
Sample Location	Date	Ammonia Nitrogen (mg/L) <sup>1</sup>	Chemical Oxygen Demand (mg/L)	Total Phosphate Phosphorous (mg/L)	Alkalinity (mg/L)	Nitrate (mg/L)	Sulfate (mg/L)	Total Dissolved Solids (mg/L)	Dissolved Methane (ug/ml) <sup>2</sup>	Nitrogen Total Kjeldahl	Total Nitrogen
MW-1	03/25/04	1.5	39	0.69	270	<0.10 <sup>3</sup>	3	360	3.1	NA <sup>4</sup>	NA
MW-2	03/25/04	3	45	1.5	190	<0.10	22	260	0.076	NA	NA
MW-3	03/25/04	1.5	91	4	250	<0.10	1.9	310	8	NA	NA
MW-4	03/25/04	1.9	170	2	600	<0.10	<0.50	680	18	NA	NA
MW-5	03/25/04	1.7	100	1.9	390	<0.10	11	500	<0.010	NA	NA
MW-6	03/25/04	<0.20	32	0.62	88	<0.10	11	140	0.01	NA	NA
MW-7	03/24/05	1.5	140	2.4	400	<0.10 <sup>3</sup>	2.1	510	2.7	3.6	3.6
1. mg/L: milligrams per Liter											
2. ug/ml: micrograms per milliliter											
3. <: Denotes a value that is "less than" the method detection limit.											
4. NA: Not Analyzed											

**Table A-7**  
**Soil Analytical Results**  
**PALCO Company Garage**  
**Scotia, California**  
**(ug/g)**

Sample Location @ Depth (feet)	Sample Date	TPHMO	TPHD	TPHG	B	T	E	X	MTBE	VOC's	pH	Soluble Iron (ug/L)	Total Iron	TOC
B-2 24-30"	12/23/1999	NA	120	2,500	<10	<20	73	<5.0	<10	NA	NA	NA	NA	NA
B-3 9-12"	12/24/1999	NA	160	2,700	<20	<30	38	<10	<40	NA	NA	NA	NA	NA
B-4 9-15"	12/25/1999	NA	1.4	5.9	<0.0050	<0.010	<0.020	<0.020	<0.050	NA	NA	NA	NA	NA
WP4 13-19"	12/26/1999	NA	1.3	14	0.041	<0.20	<0.10	<0.10	<0.10	NA	NA	NA	NA	NA
MW1 5.5-6'	12/27/1999	NA	14	490	<4.0	<5.0	12	<2.0	4.7	NA	NA	NA	NA	NA
MW2 5.5-6'	12/28/1999	NA	<1.0	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.050	NA	NA	NA	NA	NA
MW3 5.5-6'	12/29/1999	NA	4.1	1.8	<0.0050	<0.020	<0.020	<0.0050	<0.050	NA	NA	NA	NA	NA
WP-1 3.5-4'	12/30/1999	NA	<1.0	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.050	NA	NA	NA	NA	NA
WP-1 4'	12/31/1999	NA	N/A	N/A	N/A	N/A	N/A	N/A	N/A	NA	NA	NA	NA	NA
WP-2 3.5'	1/1/2000	NA	N/A	N/A	N/A	N/A	N/A	N/A	N/A	NA	NA	NA	NA	NA
WP-2 4-4.5'	1/2/2000	NA	12	280	1.6	<6.0	10	<1.0	<4.0	NA	NA	NA	NA	NA
WP-3 3.5-4'	1/3/2000	NA	<1.0	3.4	0.056	<0.10	0.038	<0.030	<0.20	NA	NA	NA	NA	NA
WP-3 4'	1/4/2000	NA	N/A	N/A	N/A	N/A	N/A	N/A	N/A	NA	NA	NA	NA	NA
WP-5 7.5-8'	1/5/2000	NA	<1.0	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.050	NA	NA	NA	NA	NA
WP-5 8'	1/6/2000	NA	N/A	N/A	N/A	N/A	N/A	N/A	N/A	NA	NA	NA	NA	NA
WP-6 3.5-4'	1/7/2000	NA	1.4	9.9	0.023	<0.060	0.15	<0.020	<0.050	NA	NA	NA	NA	NA
WP-6 4'	1/8/2000	NA	N/A	N/A	N/A	N/A	N/A	N/A	N/A	NA	NA	NA	NA	NA
B-6, 2.5-4'	11/8/2000	NA	474	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	NA	NA	NA	NA	NA
B-6, 8-8.5'	11/9/2000	NA	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	NA	NA	NA	NA	NA
B-7, 2.5-4'	11/10/2000	NA	1.46	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	NA	NA	NA	NA	NA
B-7, 6.5-7'	11/11/2000	NA	1.06	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	NA	NA	NA	NA	NA
WP-7, 5-5.5'	11/12/2000	NA	3.16	120	<0.005	<0.005	<0.005	<0.005	<0.005	NA	NA	NA	NA	NA
WP-7, 5.5-7'	11/13/2000	NA	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	NA	NA	NA	NA	NA
WP-8, 2.5-4'	11/14/2000	NA	6.94	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	NA	NA	NA	NA	NA
WP-8, 5-5.5'	11/15/2000	NA	1.86	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	NA	NA	NA	NA	NA
WP-9, 3-3.5'	11/16/2000	NA	3.44	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	NA	NA	NA	NA	NA
WP-9, 5-5.5'	11/17/2000	NA	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	NA	NA	NA	NA	NA
WP-10, 1-2.5'	11/18/2000	NA	<1.0 <sup>7</sup>	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	NA	NA	NA	NA	NA
WP-10, 2.5-4'	11/19/2000	NA	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	NA	NA	NA	NA	NA
WP-11, 4-4.5'	11/20/2000	NA	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	NA	NA	NA	NA	NA
WP-11, 5-5.5'	11/21/2000	NA	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	NA	NA	NA	NA	NA
MW-4, 5.5-6'	11/22/2000	NA	5.1	1.6	0.015	<0.005	0.018	0.0094	<0.005	NA	NA	NA	NA	NA
MW-4, 8.5-9'	11/23/2000	NA	<1.0	38	0.013	0.0093	0.18	0.12	<0.005	NA	NA	NA	NA	NA
WP-201 @ 2.5'	1/29/2004	<10	<1.0	<1.0	<0.005	<0.005	<0.005	<0.010	NA	ND	NA	NA	NA	NA
WP-202 @ 2'	1/29/2004	<10	<1.0	<1.0	<0.005	<0.005	<0.005	<0.010	NA	ND	NA	NA	NA	NA
WP-301 @ 3'	3/17/2004	<10	<1.0	3.9	0.03	<0.005	<0.005	<0.010	NA	NA	7.2	NA	NA	13,200
WP-301 @ 10'	3/17/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.0	NA	16,000	5,380
WP-302 @ 6'	3/17/2004	<10	39	520	0.74	0.67	19	19.8	NA	NA	7.2	NA	NA	4,800
WP-302 @ 10'	3/17/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.5	NA	18,000	5,830
WP-303 @ 7'	3/17/2004	<10	24	370	0.33	0.44	15	16.1	NA	NA	7.2	NA	NA	4,870
WP-303 @ 10'	3/17/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	6.8	NA	38,000	3,600
WP-305 @ 7'	3/17/2004	<10	5.4	48	<0.005	<0.005	0.0079	<0.010	NA	NA	NA	NA	NA	NA
MW-5 @ 6'	3/17/2004	<10	<1.0	<1.0	<0.005	<0.005	<0.005	<0.010	NA	NA	6.8	650,000	20,000	5,670
MW-6 @ 5'	3/17/2004	<10	<1.0	<1.0	<0.005	<0.005	<0.005	<0.010	NA	NA	6.3	130,000	22,000	1,890
MW-6 @ 10'	3/17/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	6.7	230,000	19,000	4,780
WP-401 @ 5.5'	9/24/2004	<10	<1.0	<1.0	<0.0050	<0.005	<0.0050	<0.0050	NA	NA	NA	NA	NA	NA
WP-402 @ 9'	9/25/2004	16	1.9	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	NA	NA	NA	NA	NA	NA
WP-403 @ 7'	9/26/2004	<10	<1.0	9	<0.0050	<0.20	<0.050	<0.080	NA	NA	NA	NA	NA	NA
WP-404 @ 5'	9/27/2004	<10	<1.0	3.8	<0.0050	<0.10	<0.020	<0.030	NA	NA	NA	NA	NA	NA
WP-405 @ 7.5'	9/28/2004	<10	<1.0	<1.0	<0.0050	0.0063	<0.0050	<0.0050	NA	NA	NA	NA	NA	NA
MW-7 @ 7.5'	3/4/2005	<10	<1.0	<1.0	<0.0050	<0.010	<0.0050	<0.0050	N/A	NA	NA	NA	NA	NA
B-500 @ 7.5'	3/9/2006	<10	<1.0	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.050	NA	NA	NA	NA	NA
B-501 @ 7.5'	3/9/2006	<10	<1.0	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.050	NA	NA	NA	NA	NA
B-502 @ 6.5'	3/9/2006	<10	<1.0	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.050	NA	NA	NA	NA	NA
B-503 @ 7.5'	3/9/2006	<10	<1.0	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.050	NA	NA	NA	NA	NA
B-504 @ 5.5'	3/9/2006	<10	<1.0	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.050	NA	NA	NA	NA	NA
B-505 @ 8'	3/9/2006	<10	<1.0	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.050	NA	NA	NA	NA	NA
B-506 @ 7.5'	3/9/2006	<10	<1.0	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.050	NA	NA	NA	NA	NA
B-507 @ 6.5'	3/9/2006	<10	<1.0	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.050	NA	NA	NA	NA	NA



# HOLE NUMBER MW-1

PROJECT PALCO Garage  
 LOCATION Scotia, CA  
 GROUND SURFACE ELEVATION \_\_\_\_\_  
 EXCAVATION METHOD Hollow Stem Auger  
 LOGGED BY FL

JOB NUMBER 089097.120  
 DATE DRILLED 12/7/99  
 SAMPLER TYPE Drive Sampler  
 TOTAL DEPTH OF HOLE 20.0ft.

REMARKS	DEPTH (ft.)	SAMPLES	BLOWS/6"	GRAPHIC LOG	USCS CLASS	MATERIALS DESCRIPTION	Top of Casing Elev: ft.
							WELL DIAGRAM
	1				ML	ASPHALT	<p>The well diagram shows a vertical cross-section of the borehole. At the top, a 2" Sch. 40 PVC casing is shown. Below the casing, a layer of bentonite is indicated. The main body of the well is filled with #2/12 sand. A 0.010 slotted 2" Sch. 40 PVC sampler is shown extending from the surface down to the bottom of the boring at 20.0 feet. A concrete/well box is shown at the top of the casing.</p>
	2						
	3						
	4						
	5	2				SILT, clayey, slightly fine sandy, with minor rounded gravel to 0.5" maximum dimension, moist, slight plasticity, gray with some reddish brown mottling.	
	6	4					
	7	5					
	8						
	9						
	10	2				SILT, clayey, wet, moderate plasticity, gray.	
	11	4					
	12	5					
	13						
	14						
	15	1				Increased clay content, high plasticity.	
	16	2					
	17	1					
	18						
	19						
	20					Bottom of boring at 20.0 feet.	
	21						

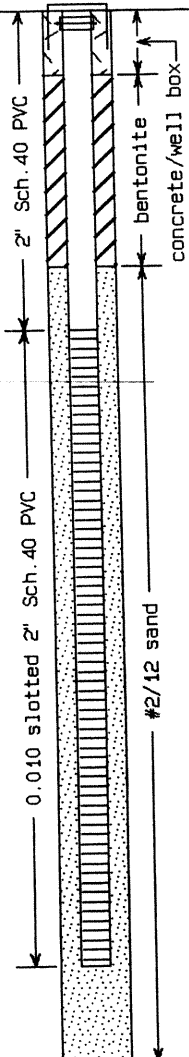
# HOLE NUMBER MW-2

PROJECT PALCO Garage  
 LOCATION Scotia, CA  
 GROUND SURFACE ELEVATION \_\_\_\_\_  
 EXCAVATION METHOD Hollow Stem Auger  
 LOGGED BY FL

JOB NUMBER 089097.120  
 DATE DRILLED 12/6/99  
 SAMPLER TYPE Drive Sampler  
 TOTAL DEPTH OF HOLE 16.5ft.

REMARKS	DEPTH (ft.)	SAMPLES	BLOWS/6"	GRAPHIC LOG	USCS CLASS	MATERIALS DESCRIPTION	Top of Casing Elev: ft.	WELL DIAGRAM
	1					FILL, gravel, sandy, silty.		
	2							
	3							
	4							
	5		2			SILT, clayey, very fine sandy, moist, moderate plasticity, gray, with minor organic nodules.		
	6		3					
	7		5					
	8							
	9							
	10		3			Increased clay content, wet, highly plastic, mottled gray and brown.		
	11		5					
	12		7					
	13							
	14							
	15		1					
	16		1					
	17		2					
	18							
	19							
	20							
	21							
						Bottom of boring at 16.5 feet.		

12/6/99



# HOLE NUMBER MW-3

PROJECT PALCO Garage

JOB NUMBER 089097.120

LOCATION Scotia, CA

DATE DRILLED 12/6/99

GROUND SURFACE ELEVATION \_\_\_\_\_

SAMPLER TYPE Drive Sampler

EXCAVATION METHOD Hollow Stem Auger

LOGGED BY FL

TOTAL DEPTH OF HOLE 16.5ft.

REMARKS	DEPTH (ft.)	SAMPLES	BLOWS/6"	GRAPHIC LOG	USCS CLASS	MATERIALS DESCRIPTION	Top of Casing Elev: ft.
							WELL DIAGRAM
	1						<p>The well diagram illustrates the vertical profile of the borehole. At the top, a 2-inch Schedule 40 PVC casing is shown. Below the casing, a bentonite seal is indicated. The main body of the well is filled with #2/12 sand. The casing is labeled '2" Sch. 40 PVC' and '0.010 slotted 2" Sch. 40 PVC'. The sand is labeled '#2/12 sand'. A concrete/well box is shown at the bottom of the casing. The total depth of the hole is 16.5 feet.</p>
	2						
	3						
	4						
	5		2			SILT, clayey, very fine sandy, moist, moderate plasticity, gray.	
	6		2				
	7						
	8						
	9						
	10		4			Decreased sand content, moist, increased plasticity, gray and reddish brown.	
	11		4				
	12		5				
	13						
	14						
	15		1				
	16		2				
	17		3			Bottom of boring at 16.5 feet.	
	18						
	19						
	20						
	21						





# CONSULTING ENGINEERS & GEOLOGISTS, INC.

812 W. Wabash • Eureka, CA 95501-2138 • 707/441-8855 • FAX: 707/441-8877 • shninfo@shn-engr.com

## BORING LOG

Boring Number MW-4

Project	<u>PALCO Garage</u>	Job No.	<u>089097</u>
Location	<u>Scotia</u>	Date Drilled	<u>11/8/00</u>
Ground Surface Elevation	<u>140.20</u>	Sampler Type	<u>CA Modified Split Spoon</u>
Boring Method	<u>Hollow Stem Auger</u>	Depth to Water	<u>8.5'</u>
Logged By	<u>SAS</u>	Boring Total Depth	<u>17'</u>

Notes	Depth (ft)	USCS Class	Blow Count	Sample Interval	Lithologic Description
	0				GRAVEL, river-run w/ some fines, wet.
Hydrocarbon odor	1	OL			
Sampled 5.5-6' @ 10:30 am	2	ML	9		CLAY, silty, brownish-gray, w/ some woody debris
	3		11		
Approx depth to water	4		14		SILT, some clay & minor fine sand, dense, moderate
8.5'	5		7		plasticity, brownish-gray, small root pieces, orange
	6		8		mottling, increase in moisture.
	7		13		
2" PVC screen 10.0 slot	8				
	9				Becomes wet.
	10				Very coarse, rounded sand present.
Well Construction	11				
Details:	12				
17 - 4' Sand	13				
4 - 2' Bentonite	14				
2 - 0' Concrete w/	15				
protective well	16	OL			Increased iron staining (mottling)
box	17				Bottom of boring 17'
	18				

## MW-5

**PROJ. NAME:** PALCO Company Garage

**LOCATION:** Scotia, CA

**PROJ. NUMBER:** 089097.120

**TOC ELEVATION:** 136.00 Feet MSL

**DRILLER:** Fisch Environmental

**DEPTH OF BORING/WELL:** 16.0 / 15.0 Feet MSL

**DRILLING METHOD:** GeoProbe / HSA

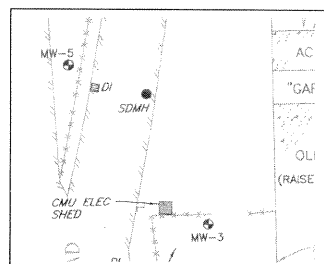
**DEPTH TO FIRST WATER:** ~7.5 Feet BGS

**SAMPLER TYPE:** Macro Core

**SCREEN INTERVAL:** 4.0 - 14.0 Feet BGS

LOGGED BY: R. Rueber

DATE: 3/17/04



ELEV. (Feet MSL)	DEPTH (Feet BGS)	WATER LEVEL	SAMPLE				USCS	Symbol	SOIL DESCRIPTION	REMARKS	MONITORING WELL CONSTRUCTION	
			OVA Reading (ppm)	Recovery (%)	BLOWS / 6"	DRILLING					LABORATORY	
0									FILL/GRAVEL, fine to coarse, sandy, clayey, dark grey, slightly moist, dense			Flushmount Christy Box Locking Cap Concrete
135					50							Bentonite Chips
		0						CL?	FILL/CLAY, sandy, fine, with silt, mottled reddish brown, dark grey, and light grey			2" SCH 40 PVC Blank
5												
130		0			100			CL	CLAY, sandy, fine, slightly moist, dark grey, stiff, few roots			
									Few fine gravels, coarse sand, medium stiff, moist to wet			2/12 Monterey Sand
10					25				Moist	Poor recovery 8-12' - no sample taken		
125		0							Color change to mottled light grey and reddish brown, very stiff to hard, slightly moist			2" SCH 40 PVC Screen (0.010 slot)
15					100							Threaded PVC End Cap
120		0							Total depth of boring = 16.0 Feet BGS			

The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

# BORING LOG

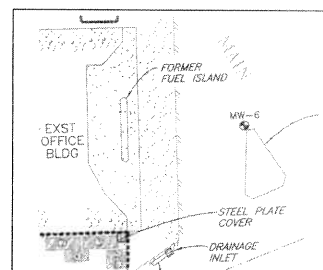


# Consulting Engineers & Geologists, Inc.

812 West Wabash, Eureka, CA ph. (707) 441-8855 fax. (707) 441-8877

## MONITORING WELL LOG

### MW-6



PROJ. NAME: PALCO Company Garage

PROJ. NUMBER: 089097.120

DRILLER: Fisch Environmental

DRILLING METHOD: GeoProbe / HSA

SAMPLER TYPE: Macro Core

LOGGED BY: R. Rueber

LOCATION: Scotia, CA

TOC ELEVATION: 146.95 Feet MSL

DEPTH OF BORING/WELL: 14.0 / 14.0 Feet MSL

DEPTH TO FIRST WATER: ~8.0 Feet BGS

SCREEN INTERVAL: 4.0 - 14.0 Feet BGS

DATE: 3/17/04

ELEV. (Feet MSL)	DEPTH (Feet BGS)	SAMPLE						USCS	Symbol	SOIL DESCRIPTION	REMARKS	MONITORING WELL CONSTRUCTION
		WATER LEVEL	OVA Reading (ppm)	Recovery (%)	BLOWS / 6"	DRILLING	LABORATORY					
0										Asphalt (2 layers)		Flushmount Christy Box Locking Cap Concrete
145										FILL/CLAY, silty, with fine sand, with gravelly, sandy intervals, mottled brown, reddish brown, and yellowish brown		Bentonite Chips
5												2" SCH 40 PVC Blank
140												
										Organic rich, dark grey layer (~2" thick)		
										CLAY/SAND, fine sandy to sand, fine clayey, mottled light brown and grey, moist to wet		2/12 Monterey Sand
10										Soft, wet, organic (charcoal) debris, few gravel		
135												2" SCH 40 PVC Screen (0.010 slot)
										Total depth of Macro Core = 12.0 Feet BGS		Threaded PVC End Cap
15											Total depth of boring = 14.0 Feet BGS	

The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

## BORING LOG

Page Number 1 of 1

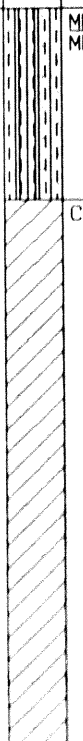


DATE: 3/4/05

Page Number 1 of 1

# HOLE NUMBER B-2

PROJECT PALCO Garage JOB NUMBER 089097.120  
 LOCATION Scotia, CA DATE DRILLED 12/6/99  
 GROUND SURFACE ELEVATION \_\_\_\_\_ SAMPLER TYPE Hand Sampled  
 EXCAVATION METHOD Hand Auger \_\_\_\_\_  
 LOGGED BY CC TOTAL DEPTH OF HOLE 3.9ft.

REMARKS	DEPTH (ft.)	SAMPLES	% RECOVERY	GRAPHIC LOG	USCS CLASS	MATERIALS DESCRIPTION	REMARKS
					ML CL CL	SILT, clayey, soft, damp, light brown.  CLAY, silty, medium stiff, moist, light brown to gray.  Becomes saturated.  Bottom of boring at 3.9 feet.	Boring put in at slight angle due to low overhead under building.  Strong smell of gasoline.
	1						
	2						
	3						
	4						
	5						
	6						
	7						

# HOLE NUMBER B-3

PROJECT PALCO Garage  
 LOCATION Scotia, CA  
 GROUND SURFACE ELEVATION \_\_\_\_\_  
 EXCAVATION METHOD Hand Auger  
 LOGGED BY CC

JOB NUMBER 089097.120  
 DATE DRILLED 12/6/99  
 SAMPLER TYPE Hand Sampled  
 TOTAL DEPTH OF HOLE 2.2ft.

REMARKS	DEPTH (ft.)	SAMPLES	% RECOVERY	GRAPHIC LOG	USCS CLASS	MATERIALS DESCRIPTION	REMARKS
	1	X			ML	SILT, clayey, soft, damp to moist, dark brown.	12/6/99 Strong smell of gasoline to bottom of boring.
	2						
	3						
	4						
	5						
	6						
	7						
						Bottom of boring at 2.2 feet.	

# HOLE NUMBER B-4

PROJECT PALCO Garage JOB NUMBER 089097.120  
 LOCATION Scotia, CA DATE DRILLED 12/6/99  
 GROUND SURFACE ELEVATION \_\_\_\_\_ SAMPLER TYPE Hand Sampled  
 EXCAVATION METHOD Hand Auger \_\_\_\_\_  
 LOGGED BY CC TOTAL DEPTH OF HOLE 1.4ft.

REMARKS	DEPTH (ft.)	SAMPLES	% RECOVERY	GRAPHIC LOG	USCS CLASS	MATERIALS DESCRIPTION	REMARKS
					MH	SILT, clayey, soft, damp, dark brown.	
	1	X			CH	CLAY, silty, damp to moist, light brown and gray.  Becomes saturated.	Light petroleum smell.
						Bottom of boring at 1.4 feet.	
	2						
	3						
	4						
	5						
	6						
	7						



# CONSULTING ENGINEERS & GEOLOGISTS, INC.

812 W. Wabash • Eureka, CA 95501-2138 • 707/441-8855 • FAX: 707/441-8877 • shninfo@shn-engr.com

## BORING LOG

Boring Number B-6

Project <u>PALCO Garage</u>		Job No. <u>089097</u>	
Location <u>Scotia</u>		Date Drilled <u>11/8/00</u>	
Ground Surface Elevation <u>138.13 feet</u>		Sampler Type <u>CA Modified Split Spoon</u>	
Boring Method <u>Hollow Stem Auger</u>		Depth to Water <u>8'</u>	
Logged By <u>SAS</u>		Boring Total Depth <u>8.5'</u>	

Notes	Depth (ft)	USCS Class	Blow Count	Sample Interval	Lithologic Description
	0				FILL, river run gravel, w/ some fines. Medium dark brown.
	1		15		
Sampled 1.5 – 2.5' @ 8:15 am	2	ML	19	1.5-2.5'	SILT, clayey, dense, wet, medium to large size Gravels, considerable mottling. Some brick fragments.
	3		11		
	3		13		SILT, clayey, dense, stiff, wet, mottled. Some dark brown organic wood waste.
	4				
Sampled 5 – 5.5' @ 8:30 am	5	ML	13	5-5.5'	some medium size gravels present.
	6		17		
	7				
Sampled interface @ 8 – 8.5' @ 8:40 am	8	CH			Clay, dense, stiff, wet, blue-gray, mottled, with wood debris.
Depth to water $\approx$ 8'	8			8-8.5'	Bottom of boring at 8.5'.
	9				





# CONSULTING ENGINEERS & GEOLOGISTS, INC.

812 W. Wabash • Eureka, CA 95501-2138 • 707/441-8855 • FAX: 707/441-8877 • shninfo@shn-engr.com

## BORING LOG

Boring Number B-7

Project <u>PALCO Garage</u>		Job No. <u>089097</u>	
Location <u>Scotia</u>		Date Drilled <u>11/8/00</u>	
Ground Surface Elevation <u>138.77'</u>		Sampler Type <u>CA Modified Split Spoon</u>	
Boring Method <u>Hollow Stem Auger</u>		Depth to Water <u>7'</u>	
Logged By <u>SAS</u>		Boring Total Depth <u>8'</u>	

Notes	Depth (ft)	USCS Class	Blow Count	Sample Interval	Lithologic Description
No retrieval; hit rock	0				FILL, river-run gravel, medium-large gravels, some fines.
	1		19		
Heavy hydrocarbon odor Sampled 2-4' @ 9:15 am	2		20		
	3	ML	23		
Hydrocarbon odor	3	ML	9	2.5-4'	SILT, clayey, blue-gray, moist, dense, stiff, medium size gravels.
	4	CL	11		CLAY, blue-gray, no gravel
No hydrocarbon odor Sampled 5 - 5.5' @ 9:20 am Hydrocarbon odor	4	CL	10		
	5	ML	10		
Sampled 6.5-7' @ 9:40 am Approx depth to water 7'	5	ML	15		SILT, clayey, brown, medium size gravels, some fines, low plasticity, low density.
	6		18		blue-gray, mottled, some wood debris
	6	CH	10		
	7	CH	11	6.5-7'	CLAY, blue-gray, mottled, some wood debris
	7		17		
	8				Becomes wet.
	8				Bottom of boring 8.5'
	9				

# HOLE NUMBER WP-1

PROJECT PALCO Garage JOB NUMBER 089097.120  
 LOCATION Scotia, CA DATE DRILLED 12/8/99  
 GROUND SURFACE ELEVATION \_\_\_\_\_ SAMPLER TYPE Drive Sampler  
 EXCAVATION METHOD SFA \_\_\_\_\_  
 LOGGED BY FL TOTAL DEPTH OF HOLE 10.0ft.

REMARKS	DEPTH (ft.)	SAMPLES	BLOWS/5"	GRAPHIC LOG	USCS CLASS	MATERIALS DESCRIPTION	Top of Casing Elev: ft.
							WELL DIAGRAM
	1						
	2						
	3		3			SILT, clayey, very fine sandy, moist, slight to moderate plasticity, gray, with pieces of organic matter.	
	4		4				
	5		5				
	6						
	7						
	8						
	9						
	10				ML		
	11					Bottom of boring at 10.0 feet.	
	12						
	13						
	14						
	15						
	16						
	17						
	18						
	19						
	20						
	21						

# HOLE NUMBER WP-2

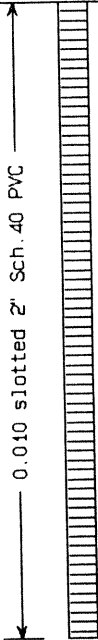
PROJECT PALCO Garage JOB NUMBER 089097.120  
 LOCATION Scotia, CA DATE DRILLED 12/7/99  
 GROUND SURFACE ELEVATION \_\_\_\_\_ SAMPLER TYPE Drive Sampler  
 EXCAVATION METHOD SFA \_\_\_\_\_  
 LOGGED BY FL TOTAL DEPTH OF HOLE 10.0ft.

REMARKS	DEPTH (ft.)	SAMPLES	BLOWS/6"	GRAPHIC LOG	USCS CLASS	MATERIALS DESCRIPTION	Top of Casing Elev: ft.
							WELL DIAGRAM
	1					CONCRETE	
	2						
	3		4			SILT, clayey, with minor fine sand, moist, slight plasticity, gray.	
	4		4				
	5		4				
	6						
	7						
	8						
	9						
	10					Bottom of boring at 10.0 feet.	
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						
	19						
	20						
	21						

# HOLE NUMBER WP-3

PROJECT PALCO Garage  
 LOCATION Scotia, CA  
 GROUND SURFACE ELEVATION \_\_\_\_\_  
 EXCAVATION METHOD SFA  
 LOGGED BY FL




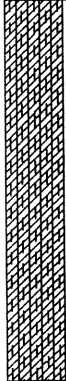
JOB NUMBER 089097.120  
 DATE DRILLED 12/7/99  
 SAMPLER TYPE Drive Sampler  
 TOTAL DEPTH OF HOLE 13.0ft.

REMARKS	DEPTH (ft.)	SAMPLES	BLOWS/6"	GRAPHIC LOG	USCS CLASS	MATERIALS DESCRIPTION	Top of Casing Elev: ft.  WELL DIAGRAM
	1						
	2						
	3		1			SILT, clayey, with minor sand, moist, slight plasticity, gray.	
	4		2				
	5		4				
	6						
	7						
	8		4				
	9		5				
	10		5				
	11						
	12						
	13					Bottom of boring at 13.0 feet.	
	14						
	15						
	16						
	17						
	18						
	19						
	20						
	21						

# HOLE NUMBER WP-4

PROJECT PALCO Garage  
 LOCATION Scotia, CA  
 GROUND SURFACE ELEVATION \_\_\_\_\_  
 EXCAVATION METHOD Hand Auger  
 LOGGED BY CC

JOB NUMBER 089097.120  
 DATE DRILLED 12/6/99  
 SAMPLER TYPE Hand Sampled  
 TOTAL DEPTH OF HOLE 4.0ft.

REMARKS	DEPTH (ft.)	SAMPLES	% RECOVERY	GRAPHIC LOG	USCS CLASS	MATERIALS DESCRIPTION	REMARKS
						FILL, gravel, sandy. loose, damp, gray.	
	1				ML MH	SILT, clayey, soft, moist, dark brown to greenish brown.	
	2				MH CH	SILT, clayey, to CLAY, silty, medium stiff, moist, dark brown to greenish brown.	12/6/99
	3						
	4					Bottom of boring at 4.0 feet.	
	5						
	6						
	7						

# HOLE NUMBER WP-5

PROJECT PALCO Garage JOB NUMBER 089097.120  
 LOCATION Scotia, CA DATE DRILLED 12/8/99  
 GROUND SURFACE ELEVATION \_\_\_\_\_ SAMPLER TYPE Drive Sampler  
 EXCAVATION METHOD SFA \_\_\_\_\_  
 LOGGED BY FL TOTAL DEPTH OF HOLE 10.0ft.

REMARKS	DEPTH (ft.)	SAMPLES	BLOWS/6"	GRAPHIC LOG	USCS CLASS	MATERIALS DESCRIPTION	Top of Casing Elev: ft.	WELL DIAGRAM
	1					WOOD, may be one large log.		<p>0.010 slotted 2" Sch. 40 PVC</p>
	2							
	3							
	4							
	5							
	6							
	7							
	8				ML	SILT, clayey, fine sandy, with minor gravel to 0.5" maximum dimension, wet, light brown and gray.		
	9							
	10					Bottom of boring at 10.0 feet.		
	11							
	12							
	13							
	14							
	15							
	16							
	17							
	18							
	19							
	20							
	21							

# HOLE NUMBER WP-6

PROJECT PALCO Garage  
 LOCATION Scotia, CA  
 GROUND SURFACE ELEVATION \_\_\_\_\_  
 EXCAVATION METHOD SFA  
 LOGGED BY FL

JOB NUMBER 089097.120  
 DATE DRILLED 12/8/99  
 SAMPLER TYPE Drive Sampler  
 TOTAL DEPTH OF HOLE 10.0ft.

REMARKS	DEPTH (ft.)	SAMPLES	BLOWS/6"	GRAPHIC LOG	USCS CLASS	MATERIALS DESCRIPTION	Top of Casing Elev: ft.
							WELL DIAGRAM
	1						
	2						
	3					SILT, clayey, fine sandy, moist, moderate plasticity, gray.	
	4						
	5						
	6						
	7		2			Becomes wet, mottled brown and gray.	
	8		4				
	9		5				
	10					Bottom of boring at 10.0 feet.	
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						
	19						
	20						
	21						



# CONSULTING ENGINEERS & GEOLOGISTS, INC.

812 W. Wabash • Eureka, CA 95501-2138 • 707/441-8855 • FAX: 707/441-8877 • shninfo@shn-engr.com

## BORING LOG

Boring Number WP-7

Project <u>PALCO Garage</u>		Job No. <u>089097</u>	
Location <u>Scotia</u>		Date Drilled <u>11/7/00</u>	
Ground Surface Elevation <u>138.79'</u>		Sampler Type <u>CA Modified Split Spoon</u>	
Boring Method <u>Hollow Stem Auger</u>		Depth to Water <u>6.6'</u>	
Logged By <u>SAS</u>		Boring Total Depth <u>10.5'</u>	

Notes	Depth (ft)	USCS Class	Blow Count	Sample Interval	Lithologic Description
	0				FILL, gravelly, brown, loose, dry, small-medium size gravels.
	1		9		
Sampled 2-2.5' @ 3:15 pm	2	ML	11		SILT, gravelly, dark brown, very dense, very stiff, moist, with some wood debris.
Sampled 2.5-4' @ 3:20 pm	3		8		No gravels; some mottling.
	4		13		Some organic matter.
	5		16		
Strong hydrocarbon odor	6		7		
Sampled 5-5.5' @ 3:30 pm	7		7		
Sampled 5.5-7' @ 3:40 pm	8		11		Small-medium size gravels
Approx. depth to water 6.6'	9				
Hydrocarbon odor.	10				
2"PVC screen 0.10	10.5				
No sample retrieval, so collected soil w/ auger @ ~9.5'; hydrocarbon odor			9		
			11		
			17		Bottom of boring 10.5'





# CONSULTING ENGINEERS & GEOLOGISTS, INC.

812 W. Wabash • Eureka, CA 95501-2138 • 707/441-8855 • FAX: 707/441-8877 • shninfo@shn-engr.com

## BORING LOG

Boring Number WP-8

Project <u>PALCO Garage</u>		Job No. <u>089097</u>	
Location <u>Scotia</u>		Date Drilled <u>11/7/00</u>	
Ground Surface Elevation <u>135.30'</u>		Sampler Type <u>CA Modified Split Spoon</u>	
Boring Method <u>Hollow Stem Auger</u>		Depth to Water <u>7'</u>	
Logged By <u>SAS</u>		Boring Total Depth <u>10.5'</u>	

Notes	Depth (ft)	USCS Class	Blow Count	Sample Interval	Lithologic Description
	0				FILL, river-run gravel, dark brown, w/some medium-large gravels, slight clay content, dense, moist
No retrieval—rock in sampler	1		20		
	2	ML	19		
			21		SILT, gravelly, very dark brown
Sampled 2.5-4' @ 12:35 pm	3	CL	3		CLAY, silty, dark brown, moist, w/some organic matter.
	4		3		
			4		Becomes dark gray, some mottling, moist.
	5		5		
Sampled 5-5.5; @ 12:45 pm			7		
2" PVC screen 0.10 slot	6				
Approx. depth to water 7'	7				
	8				
	9		7		Turns bluish-gray, wet.
	10		7		
	10.5		9		Bottom of boring 10.5'



# CONSULTING ENGINEERS & GEOLOGISTS, INC.

812 W. Wabash • Eureka, CA 95501-2138 • 707/441-8855 • FAX: 707/441-8877 • shninfo@shn-engr.com

## BORING LOG

Boring Number WP-9

Project <u>PALCO Garage</u>		Job No. <u>089097</u>	
Location <u>Scotia</u>		Date Drilled <u>11/7/00</u>	
Ground Surface Elevation <u>135.38'</u>		Sampler Type <u>CA Modified Split Spoon</u>	
Boring Method <u>Hollow Stem Auger</u>		Depth to Water <u>7'</u>	
Logged By <u>SAS</u>		Boring Total Depth <u>10'</u>	

Notes	Depth (ft)	USCS Class	Blow Count	Sample Interval	Lithologic Description
	0				FILL, gravelly, well graded, w/ some fines, loose, moist, brown, w/ some organic matter and small roots, medium-large size gravels
	1		20		
			11		
	2		9		
			7		
11:25 am	3	ML	7		SILT, clayey, brownish-gray, dense, moist.
Sampled 3-3.5' @ 11:30 am			9		Some wood debris present.
	4		3		
			3		
Sampled 5-5.5' @ 11:35 am	5		3		Some wood debris present.
2" PVC screen 0.10 slot	6				
	7				
Approximate depth to water 7'	8				
	9	CH	4		CLAY, light gray w/orange mottling, saturated, very dense, stiff, w/ some fines
			4		
	10		5		Bottom of boring 10'



# CONSULTING ENGINEERS & GEOLOGISTS, INC.

812 W. Wabash • Eureka, CA 95501-2138 • 707/441-8855 • FAX: 707/441-8877 • shninfo@shn-engr.com

## BORING LOG

Boring Number WP-10

Project	<u>PALCO Garage</u>			Job No.	<u>089097</u>
Location	<u>Scotia</u>			Date Drilled	<u>11/8/00</u>
Ground Surface Elevation	<u>134.84'</u>			Sampler Type	<u>CA Modified Split Spoon</u>
Boring Method	<u>Hollow Stem Auger</u>			Depth to Water	<u>7.5'</u>
Logged By	<u>SAS</u>			Boring Total Depth	<u>8'</u>
Notes	Depth (ft)	USCS Class	Blow Count	Sample Interval	Lithologic Description
2" PVC screen 0.10 slot  Approximate depth to water 7.5'  Backfilled with bentonite	0				FILL, river-run well-rounded gravel, brownish-gray, loose, moist, coarse to fine, weak cementation.
	1		12		
	2		12		
			7		
	3		2		
			2		
	4	ML	3		SILT, clayey, brownish-gray, saturated, dense, w/organic wood debris material layer @ interface, soft, medium plasticity.
	5				
	6				
	7				
8					Bottom of boring 8'
9					



# CONSULTING ENGINEERS & GEOLOGISTS, INC.

812 W. Wabash • Eureka, CA 95501-2138 • 707/441-8855 • FAX: 707/441-8877 • shninfo@shn-engr.com

## BORING LOG

Boring Number WP-11

Project <u>PALCO Garage</u>		Job No. <u>089097</u>	
Location <u>Scotia</u>		Date Drilled <u>11/7/00</u>	
Ground Surface Elevation <u>135.97</u>		Sampler Type <u>CA Modified Split Spoon</u>	
Boring Method <u>Hollow Stem Auger</u>		Depth to Water <u>5'</u>	
Logged By <u>SAS</u>		Boring Total Depth <u>10.5'</u>	

Notes	Depth (ft)	USCS Class	Blow Count	Sample Interval	Lithologic Description
	0				2" asphalt surface.
	1		9		FILL, gravelly, brown, loose, dry, med sz gravels, w/ some fines
	2		9		
Sampled 2-2.5' @ 2:25 pm			11	2-2.5'	
	3	ML	5		SILT, clayey, dark brown, moist, small to medium size gravels.
Sampled 3-3.5' @ 2:30 pm			7	3-3.5'	Increase in clay & moisture content, very dense, stiff, w/ some gravels.
	4		6		
Sampled 4-4.5' @ 2:35 pm			6	4-4.5'	
Approx depth to water 5'	5		9		Becomes very dense, very stiff, w/small size gravels.
Sampled 5-5.5' @ 2:35 pm			11	5-5.5'	
	6				
	7				
	8				
	9				
	10	CL	9		CLAY, blue-gray, very dense, very stiff, wet, heavy mottling.
			12		
			17		Bottom of boring 10.5'
	11				



# Consulting Engineers & Geologists, Inc.

812 West Wabash, Eureka, CA ph. (707) 441-8855 fax. (707) 441-8877

## SOIL BORING LOG

### WP-201

**PROJ. NAME:** PALCO Company Garage

**LOCATION:** Scotia, CA

**PROJ. NUMBER:** 089097.120

**DEPTH OF BORING/WELL:** 5.0 / 5.0 Feet BGS

**DRILLER:** Fisch Environmental

**SCREEN INTERVAL:** 0-5.0 Feet BGS

**DRILLING METHOD:** Hand Auger

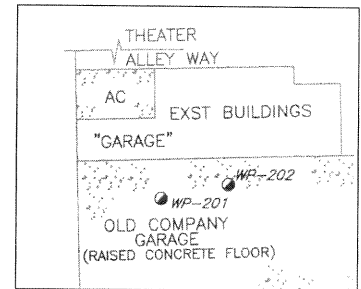
**INITIAL WATER LEVEL:** ~ 3.0 feet BGS

**SAMPLER TYPE:** Grab

**STABILIZED WATER LEVEL:** NA

**LOGGED BY:** R. Rueber

**DATE:** 1/29/04



DEPTH (Feet BGS)	WATER LEVEL	SAMPLE			USCS	SYMBOL	SOIL DESCRIPTION	REMARKS	WELLPOINT CONSTRUCTION
		OVA Reading (ppm)	DRILLING	LABORATORY					
0							GRAVEL/FILL, sandy		
							CLAY, silty, with sand, fine, dark and light brown, slightly moist, medium stiff to stiff		
							Wet @ 3.0, strong hydrocarbon odor		
5							Total depth of hand auger = 5.0 Feet BGS		3/4" SCH 40 PVC Screen
10									

The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

## BORING LOG

Page Number 1 of 1



# Consulting Engineers & Geologists, Inc.

812 West Wabash, Eureka, CA ph. (707) 441-8855 fax. (707) 441-8877

## SOIL BORING LOG

**WP-202**

**PROJ. NAME:** PALCO Company Garage

**LOCATION:** Scotia, CA

**PROJ. NUMBER:** 089097.120

**DEPTH OF BORING/WELL:** 4.0 / 4.0 Feet BGS

**DRILLER:** Fisch Environmental

**SCREEN INTERVAL:** 0-4.0 Feet BGS

**DRILLING METHOD:** Hand Auger

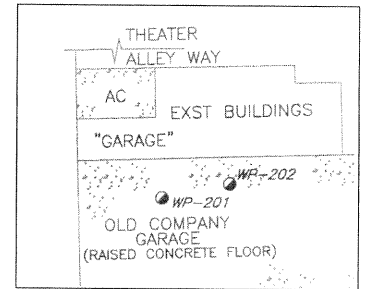
**INITIAL WATER LEVEL:** ~ 2.5 Feet BGS

**SAMPLER TYPE:** Grab

**STABILIZED WATER LEVEL:** NA

**LOGGED BY:** R. Rueber

**DATE:** 1/29/04



DEPTH (Feet BGS)	WATER LEVEL	SAMPLE			USCS	SYMBOL	SOIL DESCRIPTION	REMARKS	WELLPOINT CONSTRUCTION
		OVA Reading (ppm)	DRILLING	LABORATORY					
0							GRAVEL/FILL, sandy		
					CL		CLAY, silty, sandy, fine, dark to reddish brown, slightly moist to moist, medium stiff		
							Wet @ 2.5'		
							@ 3.0: Soft to medium stiff, moderate hydrocarbon odor		
5							Total depth of hand auger = 4.0 Feet BGS		
10									

The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

## BORING LOG

Page Number 1 of 1



# Consulting Engineers & Geologists, Inc.

812 West Wabash, Eureka, CA ph. (707) 441-8855 fax. (707) 441-8877

## SOIL BORING LOG WP-301

PROJ. NAME: PALCO Company Garage

PROJ. NUMBER: 089097.120

DRILLER: Fisch Environmental

DRILLING METHOD: GeoProbe

SAMPLER TYPE: Macro Core

LOGGED BY: R. Rueber

LOCATION: Scotia, CA

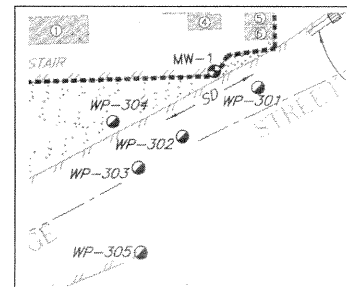
DEPTH OF BORING/WELL: 12.0 / 12.0 Feet BGS

SCREEN INTERVAL: 7.0 - 12.0 Feet BGS

INITIAL WATER LEVEL: ~8.25 Feet BGS

STABILIZED WATER LEVEL: ~4.25 Feet BGS

DATE: 3/17/04



DEPTH (Feet BGS)	WATER LEVEL	SAMPLE			SYMBOL	SOIL DESCRIPTION	REMARKS	WELLPOINT CONSTRUCTION
		OVA Reading (ppm)	DRILLING	LABORATORY				
0						Asphalt (~4" thick)		
						FILL/GRAVEL, fine, sandy, fine to coarse, with silt, medium grey, slightly moist		
					CL	CLAY, silty, mottled olive grey and green, stiff, slightly moist		
30								
						Wood debris, wet (~1")		
5						Stiff, slightly moist	Strong hydrocarbon odor 2.0 - 11.0 Feet BGS	3/4" SCH 40 PVC Blank
						Organic layer (~1"), wet, dark grey		
140								
					CL/SC	Sandy, fine, moist to wet CLAY, silty, fine sandy to SAND, fine, clayey, dark grey, moist to wet, soft (loose)	Gradational contact	
10						Soft, wet, with gravel, fine, rounded, few free product blebs		
					CL	CLAY, with silt, with sand, fine, slightly moist, dense, mottled light grey and reddish brown	Gradational contact	3/4" SCH 40 PVC Screen
12								
						Total depth of boring = 12.0 Feet BGS Boring backfilled with bentonite 3/17/04		
15								

The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

## BORING LOG

Page Number 1 of 1



# Consulting Engineers & Geologists, Inc.

812 West Wabash, Eureka, CA ph. (707) 441-8855 fax. (707) 441-8877

## SOIL BORING LOG WP-302

PROJ. NAME: PALCO Company Garage

PROJ. NUMBER: 089097.120

DRILLER: Fisch Environmental

DRILLING METHOD: GeoProbe

SAMPLER TYPE: Macro Core

LOGGED BY: R. Rueber

LOCATION: Scotia, CA

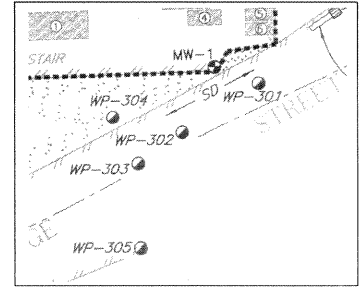
DEPTH OF BORING/WELL: 12.0 / 12.0 Feet BGS

SCREEN INTERVAL: 7.0 - 12.0 Feet BGS

INITIAL WATER LEVEL: ~7.75 Feet BGS

STABILIZED WATER LEVEL: ~4.65 Feet BGS

DATE: 3/17/04



DEPTH (Feet BGS)	WATER LEVEL	SAMPLE		USCS	SYMBOL	SOIL DESCRIPTION	REMARKS	WELLPOINT CONSTRUCTION
		OVA Reading (ppm)	DRILLING LABORATORY					
0						Asphalt (~4" thick)		
						FILL/GRAVEL, fine to coarse, sandy, fine to coarse, medium grey, slightly moist, dense		
40				CL		FILL? / CLAY, silty, sandy, fine, mottled dk. grey and reddish brown, sl. moist, stiff		
						Coarse sandy interval (~0.5" thick)		3/4" SCH 40 PVC Blank
5						CLAY, silty, dark grey, slightly moist, stiff, few wood debris		
420				SC		SAND, fine, clayey, few gravel, fine, dark grey, moist to wet, medium dense, free product blebs 9-11'	Gradational contact	
10				CL		CLAY, silty, slightly moist, hard, mottled reddish brown and light grey, few roots	Gradational contact	3/4" SCH 40 PVC Screen
0						Total depth of boring = 12.0 Feet BGS Boring backfilled with bentonite 3/17/04		
15								

The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

## BORING LOG

Page Number 1 of 1





# Consulting Engineers & Geologists, Inc.

812 West Wabash, Eureka, CA ph. (707) 441-8855 fax. (707) 441-8877

## SOIL BORING LOG

### WP-303

PROJ. NAME: PALCO Company Garage

LOCATION: Scotia, CA

PROJ. NUMBER: 089097.120

DEPTH OF BORING/WELL: 12.0 / 12.0 Feet BGS

DRILLER: Fisch Environmental

SCREEN INTERVAL: 7.0 - 12.0 Feet BGS

DRILLING METHOD: GeoProbe

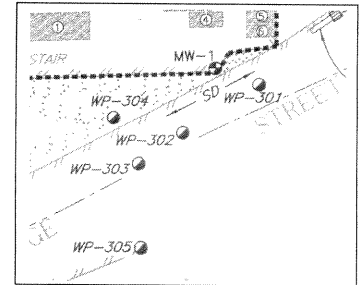
INITIAL WATER LEVEL: ~8.75 Feet BGS

SAMPLER TYPE: Macro Core

STABILIZED WATER LEVEL: ~4.35 Feet BGS

LOGGED BY: R. Rueber

DATE: 3/17/04



DEPTH (Feet BGS)	WATER LEVEL	SAMPLE			USCS	SYMBOL	SOIL DESCRIPTION	REMARKS	WELLPOINT CONSTRUCTION
		OVA Reading (ppm)	DRILLING	LABORATORY					
0							Asphalt (~4" thick)		
							FILL/GRAVEL, fine to coarse, sandy, fine to coarse, medium grey		
							FILL? / CLAY, silty, mottled medium brown and medium grey, slightly moist, stiff		
15							Organic debris		
					CL		CLAY, silty, dark grey, stiff, slightly moist		3/4" SCH 40 PVC Blank
5							Wood debris		
		322							
					SC		SAND, fine, clayey, few gravel, fine, moist to wet, dark grey, medium dense to loose	Gradational contact	
10									
					CL		CLAY, mottled medium brown and light grey, hard, slightly moist	Gradational contact	3/4" SCH 40 PVC Screen
		0							
15							Total depth of boring = 12.0 Feet BGS Boring backfilled with bentonite 3/17/04		

The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

## BORING LOG

Page Number 1 of 1

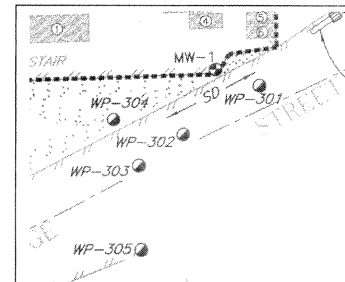


# Consulting Engineers & Geologists, Inc.

812 West Wabash, Eureka, CA ph. (707) 441-8855 fax. (707) 441-8877

## SOIL BORING LOG

### WP-304



PROJ. NAME: PALCO Company Garage

LOCATION: Scotia, CA

PROJ. NUMBER: 089097.120

DEPTH OF BORING/WELL: 12.0 / 12.0 Feet BGS

DRILLER: Fisch Environmental

SCREEN INTERVAL: 8.0 - 12.0 Feet BGS

DRILLING METHOD: GeoProbe

INITIAL WATER LEVEL: --

SAMPLER TYPE: NA

STABILIZED WATER LEVEL: ~ 5.9 Feet BGS

LOGGED BY: R. Rueber

DATE: 3/17/04

DEPTH (Feet BGS)	WATER LEVEL	SAMPLE			USCS	SYMBOL	SOIL DESCRIPTION	REMARKS	WELLPOINT CONSTRUCTION
		OVA Reading (ppm)	DRILLING	LABORATORY					
0							Concrete		
					CL/ML		FILL, gravel, fine-coarse, angular, sandy, fine-coarse, dk brown, sl. moist, dense	Drive to 12' with stainless steel screen point sampler	
					CL		CLAY, silty, few fine gravels, dark grey to medium grey, slightly moist, medium stiff, organic debris		
					CL		CLAY, as above, with less silt		
5					CL/ML		Color change to medium grey, with few reddish-brown mottles	Pneumatic slug test performed	Stainless Steel Drive Rod
					CL		CLAY, silty, slightly moist, soft, greenish-grey, few wood debris, roots throughout		
					CL		CLAY, with silt, slightly moist, medium stiff, greenish-grey, few organic debris	No samples taken	
10							CLAY, with few fine gravels, rounded, with fine sand, soft to medium stiff		Stainless Steel Screen
15							Total depth of boring = 12.0 Feet BGS Boring backfilled with bentonite 3/17/04 Lithology from WP-101		

The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

## BORING LOG

Page Number 1 of 1



# Consulting Engineers & Geologists, Inc.

812 West Wabash, Eureka, CA ph. (707) 441-8855 fax. (707) 441-8877

## SOIL BORING LOG

### WP-305

PROJ. NAME: PALCO Company Garage

PROJ. NUMBER: 089097.120

DRILLER: Fisch Environmental

DRILLING METHOD: GeoProbe

SAMPLER TYPE: Macro Core

LOGGED BY: R. Rueber

LOCATION: Scotia, CA

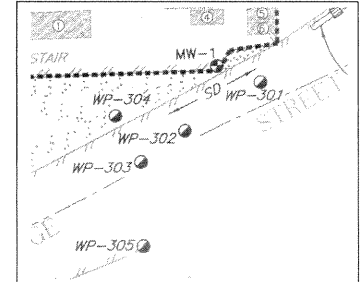
DEPTH OF BORING/WELL: 12.0 / 12.0 Feet BGS

SCREEN INTERVAL: 7.0 - 12.0 Feet BGS

INITIAL WATER LEVEL: ~7.5 Feet BGS

STABILIZED WATER LEVEL: ~4.0 Feet BGS

DATE: 3/17/04



DEPTH (Feet BGS)	WATER LEVEL	SAMPLE			USCS	SYMBOL	SOIL DESCRIPTION	REMARKS	WELLPOINT CONSTRUCTION
		OVA Reading (ppm)	DRILLING	LABORATORY					
0							Asphalt (~5" thick)		
							FILL/GRAVEL, fine to coarse, sandy, fine to coarse, medium grey, slightly moist, dense		
	0				CL		CLAY, silty, dark grey, slightly moist, stiff	Gradational contact	3/4" SCH 40 PVC Blank
5									
	100				ML		SILT, sandy, fine, with clay, moist to wet, dark grey, soft	Gradational contact	
					GC		GRAVEL, fine-coarse, rounded, trace fine sand, clayey, dark grey, wet, med. dense		
10					SC		SAND, fine, clayey to clayey fine SAND, moist to wet, dark grey, medium dense		3/4" SCH 40 PVC Screen
	0				CL		CLAY, with silt, mottled light grey and reddish brown, slightly moist, hard	Gradational contact	
15							Total depth of boring = 12.0 Feet BGS Boring backfilled with bentonite 3/17/04		

The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

## BORING LOG

Page Number 1 of 1



PROJ. NAME: PALCO Co. Garage

PROJ. NUMBER: 089097.120

DRILLER: Fisch Environmental

DRILLING METHOD: GeoProbe

SAMPLER TYPE: MIP / Macro Core

LOGGED BY: R. Rueber

LOCATION: Scotia, CA

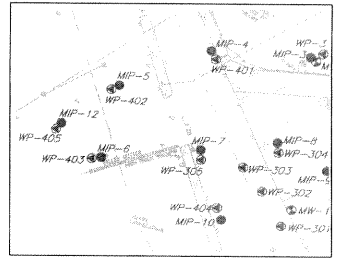
GROUND ELEVATION: ~145 NAVD88

DEPTH OF BORING/WELL: 18.1 / 16.0 Feet BGS

DEPTH TO FIRST WATER: --

SCREEN INTERVAL: --

DATE: 9/5/04 &amp; 9/23/04



ELEV. (Feet MSL) DEPTH (Feet BGS)	WATER LEVEL	SAMPLE		USCS	LITHOLOGY	SOIL DESCRIPTION	MIP RESULTS		WELLPOINT CONSTRUCTION
		OVA Reading (ppm)	DRILLING LABORATORY				Conductivity (mS/m)	FID (micro volts)	
145 0						Concrete, gravel base, fine to coarse, angular, fine sandy, dark brown, dense			No wellpoint installed
				CL/ML		CLAY, silty, few fine gravels, dark to medium grey, slightly moist, medium stiff, organic debris			
				CL		CLAY, as above, with less silt			
140 5		5,000		CL/ML		Med. grey with reddish brown mottles CLAY, silty, slightly moist, soft, greenish grey, few wood debris, roots throughout			
				CL		CLAY, with silt, slightly moist, medium stiff, greenish grey, few organic debris			
		5,000							
135 10						CLAY, with few fine gravels, rounded, with fine sand, soft to medium stiff			
		20				Becomes stiff to very stiff CLAY, mottled light grey and reddish brown, trace silt and fine sand, few organic debris			
130 15									
						Lithology from WP-101 (9/5/04)			
125 20									

The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.



**PROJ. NAME:** PALCO Co. Garage

**PROJ. NUMBER:** 089097.120

**DRILLER:** Fisch Environmental

**DRILLING METHOD:** GeoProbe

**SAMPLER TYPE:** MIP / Macro Core

**LOGGED BY:** R. Rueber

**LOCATION:** Scotia, CA

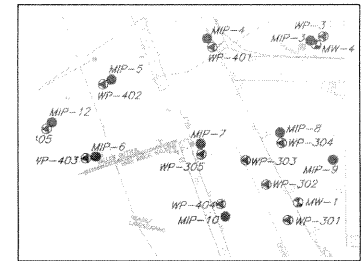
**GROUND ELEVATION:** ~141.80 NAVD88

**DEPTH OF BORING/WELL:** 18.45 / 12.0 Feet BGS

**DEPTH TO FIRST WATER:** --

**SCREEN INTERVAL:** 7.0-12.0 Feet BGS

**DATE:** 9/23/04 & 9/24/04



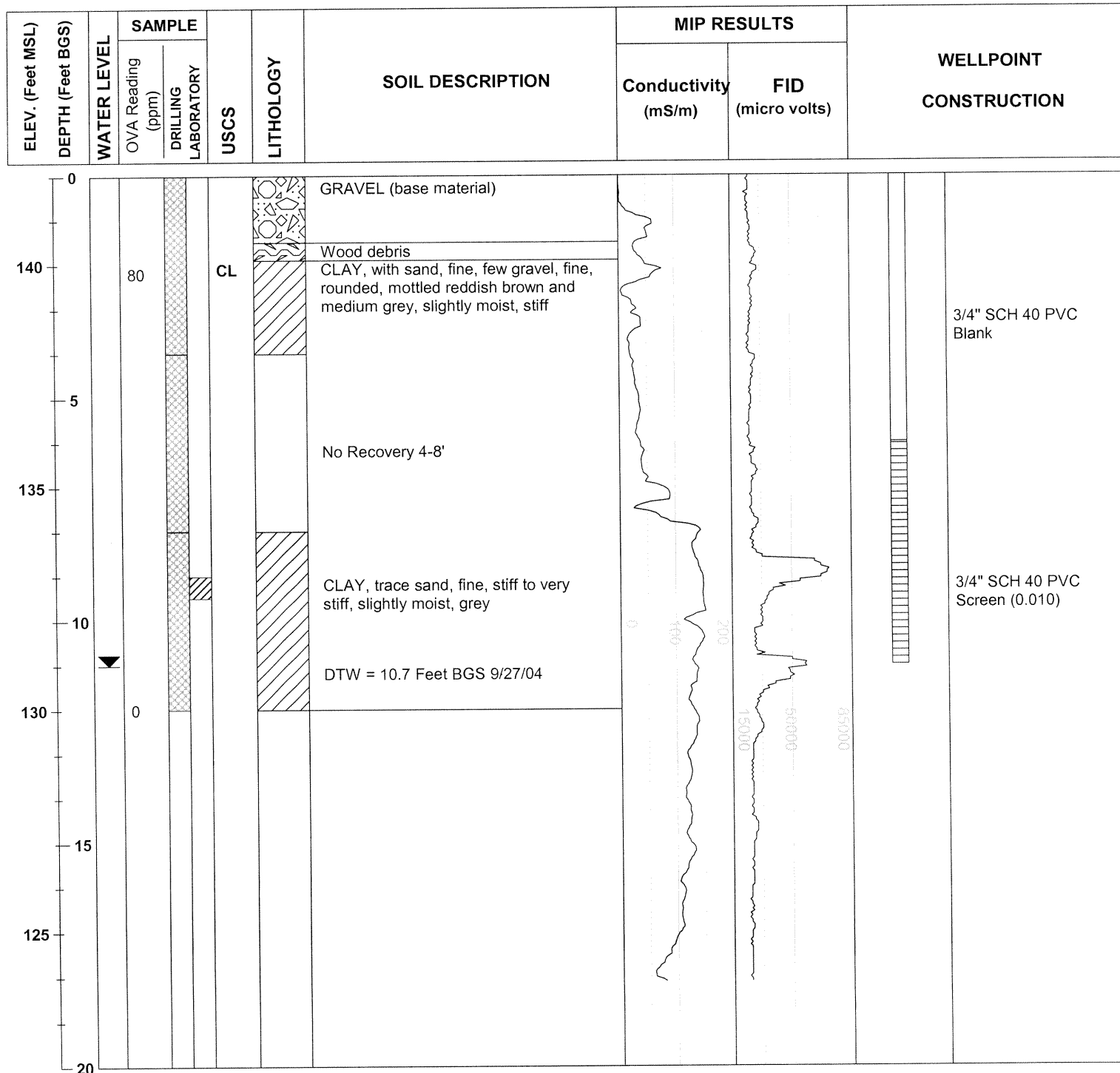
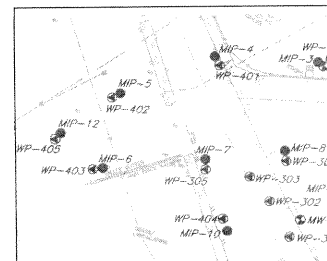
ELEV. (Feet MSL)	DEPTH (Feet BGS)	WATER LEVEL	SAMPLE		USCS	LITHOLOGY	SOIL DESCRIPTION	MIP RESULTS		WELLPOINT CONSTRUCTION
			OVA Reading (ppm)	DRILLING LABORATORY				Conductivity (mS/m)	FID (micro volts)	
0							Asphaltic concrete and baserock			
140							FILL, CLAY, sandy, fine, with gravel, fine, rounded, slightly moist, greenish grey to black, few organics			
					CL		CLAY (FILL?), sandy, fine, greenish grey, slightly moist, medium stiff to stiff			3/4" SCH 40 PVC Blank
5							4-5': mottled, greenish grey to black, FILL?			
135							Wood debris			
					ML/CL		SILT, clayey, dark grey, abundant small wood and sawdust debris (FILL?)			
10							SAND, clayey, greenish grey @ 9.5' Glass fragment, moist, soft to medium stiff			3/4" SCH 40 PVC Screen (0.010)
					SC/CL		CLAY, silty, sandy, fine, dark grey with small greenish grey sandy zones			
130					CL					
					SC		SAND, fine, clayey, greenish grey, slightly moist, medium dense, slight hydrocarbon odor, few roots			
15							Boring backfilled with neat cement			
125										
20										

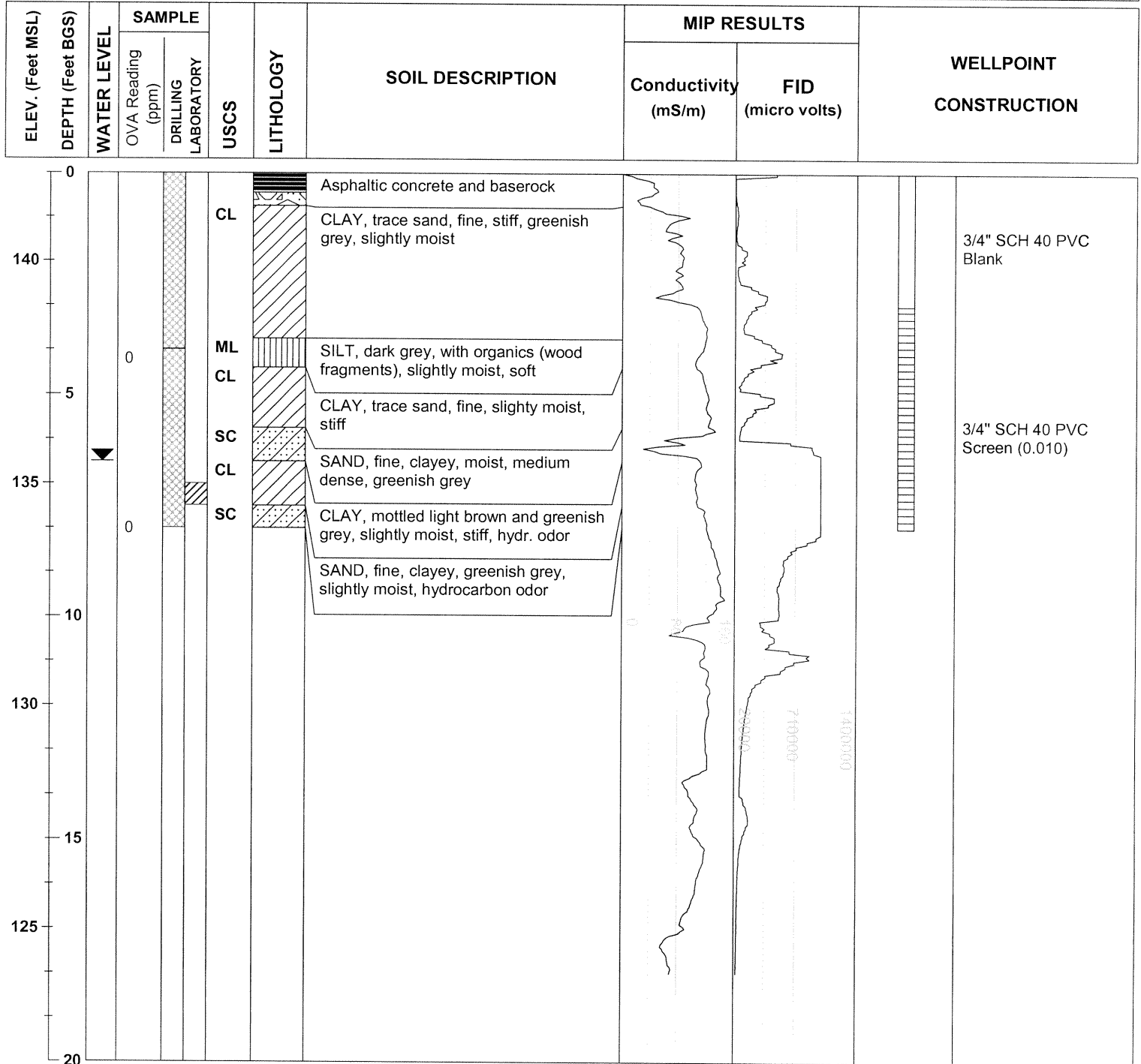
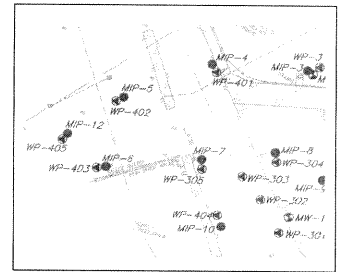
The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.



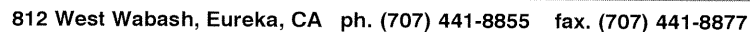
**PROJ. NAME:** PALCO Co. Garage  
**PROJ. NUMBER:** 089097.120  
**DRILLER:** Fisch Environmental  
**DRILLING METHOD:** GeoProbe  
**SAMPLER TYPE:** MIP / Macro Core  
**LOGGED BY:** R. Rueber

**LOCATION:** Scotia, CA  
**GROUND ELEVATION:** ~ 142 NAVD88  
**DEPTH OF BORING/WELL:** 18.1 / 12.0 Feet BGS  
**DEPTH TO FIRST WATER:** --  
**SCREEN INTERVAL:** 6.0-11.0 Feet BGS  
**DATE:** 9/23/04 & 9/24/04



**PROJ. NAME:** PALCO Co. Garage**PROJ. NUMBER:** 089097.120**DRILLER:** Fisch Environmental**DRILLING METHOD:** GeoProbe**SAMPLER TYPE:** MIP / Macro Core**LOGGED BY:** R. Rueber**LOCATION:** Scotia, CA**GROUND ELEVATION:** ~142 NAVD88**DEPTH OF BORING/WELL:** 18.1 / 8.0 Feet BGS**DEPTH TO FIRST WATER:** --**SCREEN INTERVAL:** 3.0- 8.0 Feet BGS**DATE:** 9/23/04 & 9/24/04

The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.



**DATE:** 9/23/04 & 9/24/04





PROJ. NAME: PALCO Co. Garage

PROJ. NUMBER: 089097.120

DRILLER: Fisch Environmental

DRILLING METHOD: GeoProbe

SAMPLER TYPE: MIP / Macro Core

LOGGED BY: R. Rueber

LOCATION: Scotia, CA

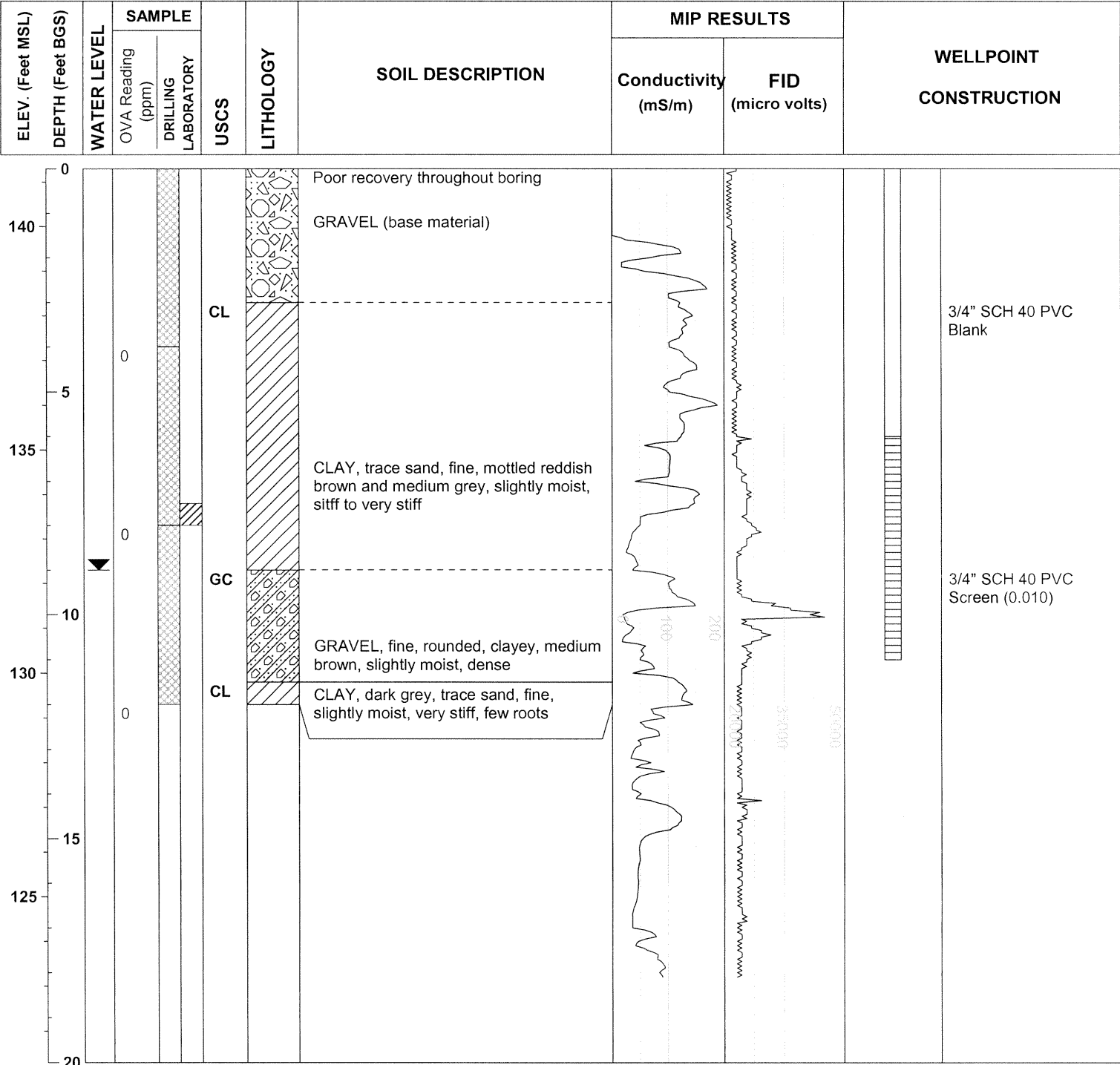
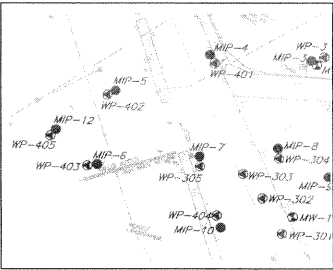
GROUND ELEVATION: ~141 NAVD88

DEPTH OF BORING/WELL: 18.10 / 11.0 Feet BGS

DEPTH TO FIRST WATER: --

SCREEN INTERVAL: 6.0- 11.0 Feet BGS

DATE: 9/23/04



The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.



# Consulting Engineers & Geologists, Inc.

812 West Wabash, Eureka, CA ph. (707) 441-8855 fax. (707) 441-8877

## WELLPOINT LOG

### B-500

PROJ. NAME: PALCO Company Garage

LOCATION: Scotia, CA

PROJ. NUMBER: 089097.120

GROUND ELEVATION:--

DRILLER: Fisch Drilling

DEPTH OF BORING/WELLPOINT: 14.0 / 14.0 Feet BGS

DRILLING METHOD: GeoProbe

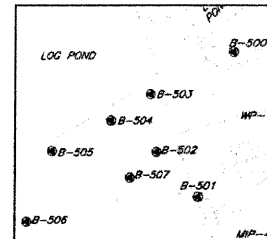
DEPTH TO FIRST WATER: ~3.45 Feet BGS

SAMPLER TYPE: Macro Core

SCREEN INTERVAL: 4.0-14.0 Feet BGS

LOGGED BY: R. Rueber

DATE: 3/9/06



DEPTH (Feet BGS)	SAMPLE					LITHOLOGY PATTERN	SOIL DESCRIPTION	REMARKS	WELLPOINT CONSTRUCTION
	WATER LEVEL	OVA READING (ppm)	BLOWS / 6"	RECOVERY (%)	DRILLING LABORATORY				
0						SW	FILL, SAND, fine to coarse, gravelly, fine to coarse, to 4", rounded, dense, moist, few small wood fragments		Bentonite Chips
25						ML	SILT, sandy, fine, trace clay, trace gravel, fine, rounded, medium stiff, slightly moist, greenish grey, few brick fragments, few roots	Contact approximate DTW ~ 3.45 Feet BGS (3/10/06)	3/4" SCH 40 PVC Blank
5							Wood Fragment		2/12 Monterey Sand
90							SILT, as above, with clay		
10							Soft, moist interval 12-13'		
15						ML	SILT, with sand, fine, few gravel, fine, rounded, medium stiff, slightly moist, dark greenish grey, few roots	Contact approximate	3/4" SCH 40 PVC Screen (0.010 slot)
Total depth of boring = 14 Feet BGS Backfilled with bentonite 3/10/06									



# Consulting Engineers & Geologists, Inc.

812 West Wabash, Eureka, CA ph. (707) 441-8855 fax. (707) 441-8877

## WELLPOINT LOG B-501

PROJ. NAME: PALCO Company Garage

LOCATION: Scotia, CA

PROJ. NUMBER: 089097.120

GROUND ELEVATION:--

DRILLER: Fisch Drilling

DEPTH OF BORING/WELLPOINT: 14.0 / 14.0 Feet BGS

DRILLING METHOD: GeoProbe

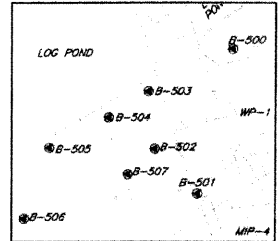
DEPTH TO FIRST WATER: ~6.0 Feet BGS

SAMPLER TYPE: Macro Core

SCREEN INTERVAL: 4.0-14.0 Feet BGS

LOGGED BY: R. Rueber

DATE: 3/9/06



DEPTH (Feet BGS)	SAMPLE					LITHOLOGY PATTERN	SOIL DESCRIPTION	REMARKS	WELLPOINT CONSTRUCTION
	WATER LEVEL	OVA READING (ppm)	BLOWS / 6"	RECOVERY (%)	DRILLING LABORATORY				
0						ML/CL	Asphalt (~4" thick) with baserock		
						CL	SILT(FILL?), clayey, trace sand, fine, stiff, slightly moist, greenish grey, few organics		
50						CL	CLAY, with silt, stiff, slightly moist, greenish grey to greenish brown, few root holes		Bentonite Chips
	0					ML/CL	SILT, as above, few wood fragments	DTW ~ 6.0 Feet BGS (3/10/06)	3/4" SCH 40 PVC Blank
90						SM/ML	SAND, fine, silty, loose, moist, greenish grey, few fine organics		2/12 Monterey Sand
	0					CL	CLAY, as above, very stiff		3/4" SCH 40 PVC Screen (0.010 slot)
15							Total depth of boring = 14 Feet BGS Backfilled with bentonite 3/10/06		



**WELLPOINT LOG  
B-502**

**PROJ. NAME:** PALCO Company Garage

**LOCATION:** Scotia, CA

**PROJ. NUMBER:** 089097.120

**GROUND ELEVATION:**--

**DRILLER:** Fisch Drilling

**DEPTH OF BORING/WELLPOINT:** 14.0 / 14.0 Feet BGS

**DRILLING METHOD:** GeoProbe

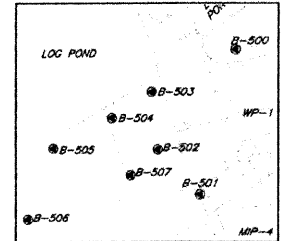
**DEPTH TO FIRST WATER:** ~5.5 Feet BGS

**SAMPLER TYPE:** Macro Core

**SCREEN INTERVAL:** 4.0-14.0 Feet BGS

**LOGGED BY:** R. Rueber

**DATE:** 3/9/06



DEPTH (Feet BGS)	SAMPLE					LITHOLOGY PATTERN	SOIL DESCRIPTION	REMARKS	WELLPOINT CONSTRUCTION
	WATER LEVEL	OVA READING (ppm)	BLOWS / 6"	RECOVERY (%)	DRILLING LABORATORY				
0						GW	FILL, GRAVEL, fine to coarse, rounded, sandy, fine to coarse, silty, medium dense, slightly moist to moist, medium brown		Bentonite Chips
			50						
	0					ML	SILT, sandy, fine, medium stiff, slightly moist, greenish grey	Contact Approximate	3/4" SCH 40 PVC Blank
5						SM	SAND, fine, silty, medium dense, moist to wet, greenish grey	Gradational Contact	
			80					DTW ~ 5.5 Feet BGS (3/10/06)	2/12 Monterey Sand
	0						Few gravel, fine, rounded		
10							Mottled greenish grey and reddish brown		
	0					CL	CLAY, silty, with sand, fine, stiff, slightly moist, mottled greenish grey and reddish brown		3/4" SCH 40 PVC Screen (0.010 slot)
			90						
15							Total depth of boring = 14 Feet BGS Backfilled with bentonite 3/10/06		



# Consulting Engineers & Geologists, Inc.

812 West Wabash, Eureka, CA ph. (707) 441-8855 fax. (707) 441-8877

## WELLPOINT LOG B-503

PROJ. NAME: PALCO Company Garage

LOCATION: Scotia, CA

PROJ. NUMBER: 089097.120

GROUND ELEVATION:--

DRILLER: Fisch Drilling

DEPTH OF BORING/WELLPOINT: 14.0 / 14.0 Feet BGS

DRILLING METHOD: GeoProbe

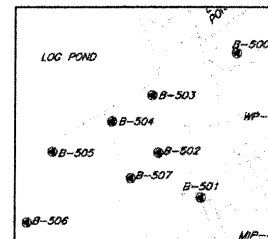
DEPTH TO FIRST WATER: ~4.5 Feet BGS

SAMPLER TYPE: Macro Core

SCREEN INTERVAL: 4.0-14.0 Feet BGS

LOGGED BY: R. Rueber

DATE: 3/9/06



DEPTH (Feet BGS)	SAMPLE					LITHOLOGY PATTERN	SOIL DESCRIPTION	REMARKS	WELLPOINT CONSTRUCTION
	WATER LEVEL	OVA READING (ppm)	BLOWS / 6"	RECOVERY (%)	DRILLING LABORATORY				
0						GW	FILL, GRAVEL, fine, rounded, sandy, fine to coarse, silty, dense, slightly moist, medium brown		Bentonite Chips
									3/4" SCH 40 PVC Blank
0						SM	Wood Fragment		
5							SAND, fine, silty, trace clay, medium dense, slightly moist, greenish grey	DTW ~4.5 Feet BGS (3/10/06)	
							@7-8' Gravelly, fine, moist		2/12 Monterey Sand
							8-11' Soft 8-9' Wet		
10							Slightly moist, clayey		3/4" SCH 40 PVC Screen (0.010 slot)
						CL	CLAY, silty, stiff, slightly moist, mottled greenish grey and reddish brown, few roots		
15							Total depth of boring = 14 Feet BGS Backfilled with bentonite 3/10/06		



**Consulting Engineers & Geologists, Inc.**  
812 West Wabash, Eureka, CA ph. (707) 441-8855 fax. (707) 441-8877

**WELLPOINT LOG  
B-504**

**PROJ. NAME:** PALCO Company Garage

**LOCATION:** Scotia, CA

**PROJ. NUMBER:** 089097.120

**GROUND ELEVATION:**--

**DRILLER:** Fisch Drilling

**DEPTH OF BORING/WELLPOINT:** 14.0 / 14.0 Feet BGS

**DRILLING METHOD:** GeoProbe

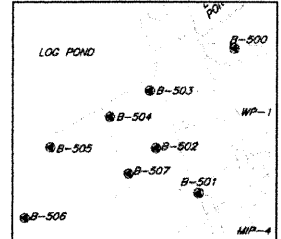
**DEPTH TO FIRST WATER:** ~5.5 Feet BGS

**SAMPLER TYPE:** Macro Core

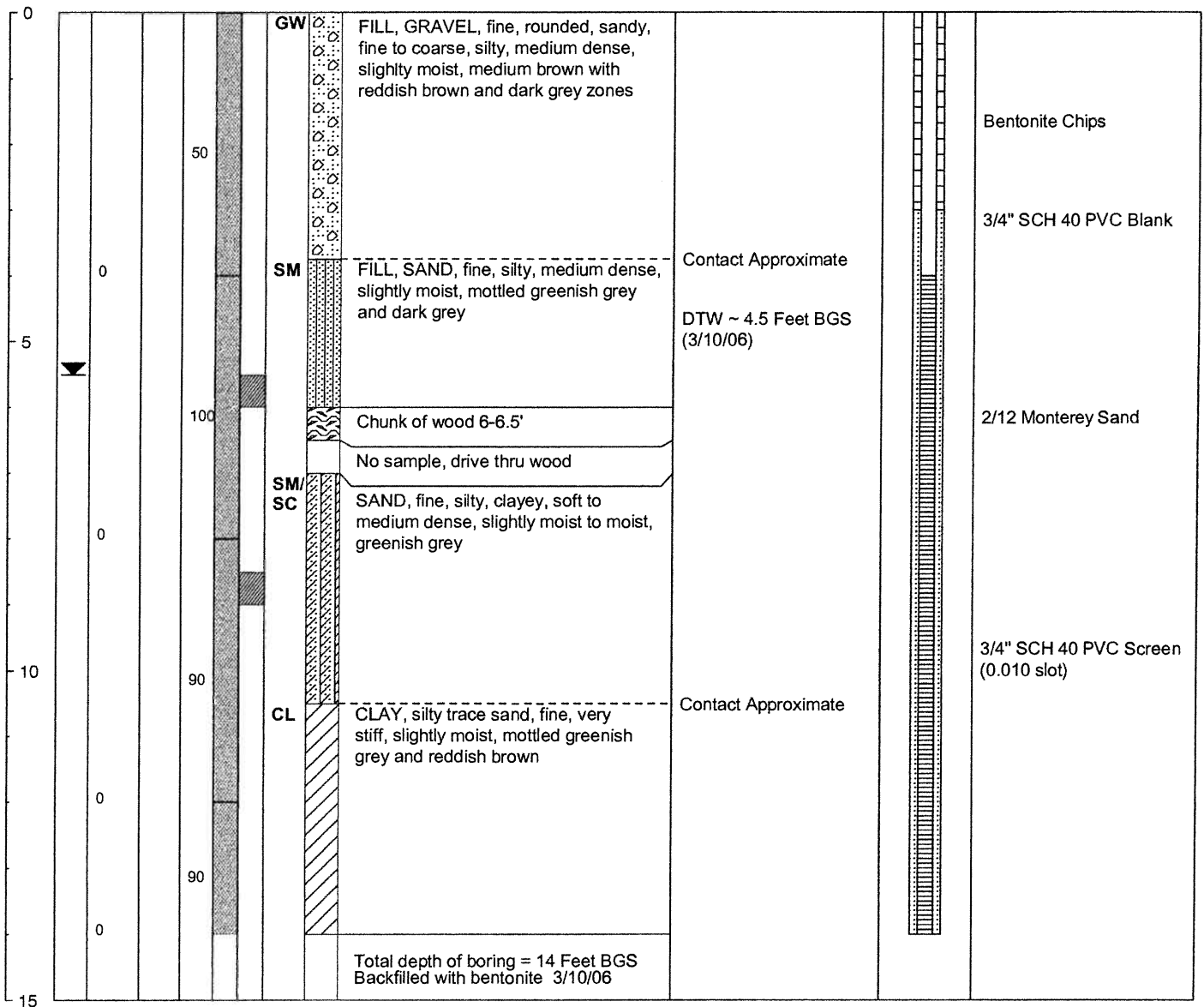
**SCREEN INTERVAL:** 4.0-14.0 Feet BGS

**LOGGED BY:** R. Rueber

**DATE:** 3/9/06



DEPTH (Feet BGS)	SAMPLE					LITHOLOGY PATTERN	SOIL DESCRIPTION	REMARKS	WELLPOINT CONSTRUCTION
	WATER LEVEL	OVA READING (ppm)	BLOWS / 6"	RECOVERY (%)	DRILLING LABORATORY				





# Consulting Engineers & Geologists, Inc.

812 West Wabash, Eureka, CA ph. (707) 441-8855 fax. (707) 441-8877

## WELLPOINT LOG B-505

PROJ. NAME: PALCO Company Garage

LOCATION: Scotia, CA

PROJ. NUMBER: 089097.120

GROUND ELEVATION:--

DRILLER: Fisch Drilling

DEPTH OF BORING/WELLPOINT: 14.0 / 14.0 Feet BGS

DRILLING METHOD: GeoProbe

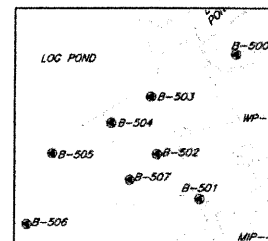
DEPTH TO FIRST WATER: ~6.0 Feet BGS

SAMPLER TYPE: Macro Core

SCREEN INTERVAL: 4.0-14.0 Feet BGS

LOGGED BY: R. Rueber

DATE: 3/9/06



DEPTH (Feet BGS)	SAMPLE					LITHOLOGY PATTERN	SOIL DESCRIPTION	REMARKS	WELLPOINT CONSTRUCTION
	WATER LEVEL	OVA READING (ppm)	BLOWS / 6"	RECOVERY (%)	DRILLING LABORATORY				
0							FILL, GRAVEL, fine, sandy, fine to coarse, silty, medium dense, slightly moist, medium brown and dark grey		Bentonite Chips
				70			SILT, clayey, stiff, slightly moist, mottled medium and reddish brown, with roots		3/4" SCH 40 PVC Blank
5				?			CLAY, silty, slightly moist, mottled medium grey and reddish brown, few roots	DTW ~ 6.0 Feet BGS (3/10/06)	2/12 Monterey Sand
							No Recovery		
							SAND, fine, silty, with clay, medium dense, moist, medium grey		
10				?			CLAY, silty, trace sand, fine, stiff, slightly moist, mottled medium grey and reddish brown		3/4" SCH 40 PVC Screen (0.010 slot)
							Become sandy, medium stiff		
15							Total depth of boring = 14 Feet BGS Backfilled with bentonite 3/10/06		



# Consulting Engineers & Geologists, Inc.

812 West Wabash, Eureka, CA ph. (707) 441-8855 fax. (707) 441-8877

## WELLPOINT LOG

B-506

PROJ. NAME: PALCO Company Garage

LOCATION: Scotia, CA

PROJ. NUMBER: 089097.120

GROUND ELEVATION:--

DRILLER: Fisch Drilling

DEPTH OF BORING/WELLPOINT: 14.0 / 14.0 Feet BGS

DRILLING METHOD: GeoProbe

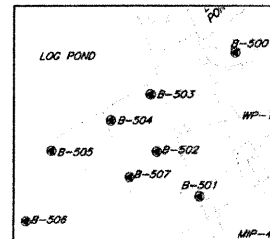
DEPTH TO FIRST WATER: ~7.5 Feet BGS

SAMPLER TYPE: Macro Core

SCREEN INTERVAL: 10.0-14.0 Feet BGS

LOGGED BY: R. Rueber

DATE: 3/9/06



DEPTH (Feet BGS)	SAMPLE					LITHOLOGY PATTERN	SOIL DESCRIPTION	REMARKS	WELLPOINT CONSTRUCTION
	WATER LEVEL	OVA READING (ppm)	BLOWS / 6"	RECOVERY (%)	DRILLING LABORATORY				
0						GW	FILL, GRAVEL, fine to coarse, sandy, fine to coarse, silty, medium dense, slightly moist, medium brown		
4.0						CL	CLAY, silty, trace sand, fine, stiff, slightly moist, mottled medium brown and reddish brown, few organics and roots	Contact Approximate  @ 4' Color change to medium grey with few dark greenish mottles, very stiff	Stainless Steel Rod
9.0						CL	CLAY, silty, with sand, fine, stiff, slightly moist, mottled medium grey reddish brown, few roots	Contact Approximate	Stainless Steel Retractable Screen (10-14')
14.0						ML/SM	SILT, sandy, fine, medium stiff, slightly moist to moist, mottled medium grey and reddish brown, few roots	Contact Approximate	
Total depth of boring = 12 Feet BGS Backfilled with bentonite 3/9/06									

## BORING LOG

Page Number 1 of 1



